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CONCERNING INJURIES OF THE SPINAL CORD*

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It is most fitting that we should discuss within the precincts of this university the question of spinal injuries and the accompanying injuries of the cord, that we should pool our experiences in this town where Sir Charles Sherrington has for so many years conducted his researches into spinal nervous function. If we know much less about the damaged human spinal cord than we do of the cat's it is because accident inflicts crude and clumsy injuries at its own time and in its own way. Moreover, the unwieldy mass of the human subject renders it difficult material to handle, and, apart from humaner considerations, its very proper demand for a high level of comfort makes it in the acuter stages of injury difficult of quiet observation. These thoughts are induced by reflection on the great debt which science owes to this school, for the brilliance of its researches, for the great ingenuity with which experiments have been planned to give understandable answers.

While this discussion is limited by its terms of reference to spinal cord damage, it is obvious that we cannot completely deny ourselves any allusion to the vertebral injuries which accompany it. We must contribute something, if we can, to the very important problem of treatment of the injury, which entails a consideration of the damage as a whole, both neural and osseous. We shall be led thus to consider methods of treatment and to pronounce, if the facts allow it, a preference for one method over another.

Elective Sites

My own records are of seventy-five cases of cord or root injury, of which thirty-nine are cervical injuries, twenty-two are lumbar, and fourteen are thoracic injuries.

In previous papers I have commented on the frequency of damage at certain levels rather than at others, and have concluded that the injuries occur at the points of greatest mobility in the spinal column, and not, as was previously believed, at the springer points, where a relatively immobile portion joins with a more freely moving segment. The special proneness to damage of the fourth, fifth, and sixth cervical vertebrae, and of the twelfth dorsal and first lumbar, would make it probable that cord injury is commoner at those levels than elsewhere—it is so in my series. On the other hand, the relative narrowness of the thoracic spine and the fact that it is only injured by force of a particular kind and direction makes concurrent cord injury more uniformly present with these relatively rarer injuries than is the case at the two sites of election. At these two latter places vertebral injury is by no means uncommonly unaccompanied by neural damage. The result is that the graph of incidence of cord injury, while still showing cervical and lumbar peaks, is a little higher in the thoracic region for cord injuries than it is when uncomplicated bone injury is charted. One may well meet with three or four compression fractures without cord complication for every one that has it.

Mechanism of Injury

The mechanism of vertebral injury is so well understood to-day that there is no need to dwell on it. I have described it very fully before.[6] Damage to the cord occurs most particularly when there is displacement as well as compression of a vertebral body, but it can also take place during excessive flexion alone. I am inclined to think that the train of events in the cervical and lumbar regions is rather different. In the former excessive forward flexion of the head leads eventually to rupture not only of the zygapophyseal joint capsules, but also of the intervertebral disk. In this instance not only does the upper fragment (the head and upper vertebrae) move freely forward and injure the cord, but it allows of easy replacement. Thus comes about the interesting though useless fact that replacement of the dislocated vertebrae is easier in cases with severe cord damage than in those where it is slight. One other point of interest arises also, and that is that this same mobility and ease of recoil explains why in some cases of haematomyelia in the cervical region no sign of vertebral displacement can be disclosed by the most careful of *x*-ray examinations. In the lumbar region displacement and recoil can rarely occur, and here I incline to the view that rupture of the intervertebral disk with backward displacement of the liquid contents of nucleus pulposus contributes something of a nocuous kind to the injury, but it does not do so invariably.

Effects of Cord Damage

It is well accepted that loss of function following a spinal injury is due to neural injury inflicted at the instant of primary deformity. It would be untrue to follow this up with the statement that the cord is very rarely compressed by bone fragments, because we know from experience that sometimes it is so inconvenienced, and is then usually irreparably damaged. It is generally agreed that central haemorrhages occur into the well-vascularized substantia grisea of the cord, and it is assumed that this is the cause of the neural disturbances whether vertebral injury is clearly manifest or not. Every surgeon accustomed to operating on the spinal cord knows how tough is its pial covering, and it is easy to visualize pulping of the contents of this strong sheath and to predicate central haemorrhage. It comes, therefore, as

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something of a surprise to find that the cervical cord in cases of fatal injury often fails to show bleeding. It cannot be stated that haemorrhage never arises, for it is necessarily present when the cord is actually torn; but it is not a feature in those common instances when the cord is fatally contused without any notable alteration in its external appearance save swelling.

The notion that a sudden squeeze sets up a massive haemorrhage and that the pressure and possible disruptive effects of that are the cause of the resulting dysfunctions must be accepted with caution. It is doubtful whether such a state as "haematomyelia" actually exists. It is more than probable that the clinical syndrome which we call, and no doubt shall continue to call, haematomyelia is due to local neural disruption, to relatively bloodless contusion, rather than to intramedullary clot. The damage which does in fact occur is in the nature of rupture of myelin sheaths, fracture of axons and nerve fibrils, contusion of nerve cells in the central grey mass, a distortion of the general cord pattern in which sliding of neural elements on the fibrous mesodermal partitions plays a considerable part. In most cases there are evidences of oedema due to the disturbance of humoral barrier mechanisms in the intraspinal capillaries. The appearances of the cord in some fatalities leaves the impression that the patient might have recovered if he could have survived the initial period of profound depression of function. We still lack information as to the extent to which axonal rupture takes place in the long projection paths. It may be that injury to the myelin sheaths is not of primary importance, for the axon will still conduct when this is damaged. It is my impression that we have a sure clinical indication of axonal rupture in the state of sensation in the patient with an injured cord, and a less sure indication in the degree of paralysis. This brings us to the difficult subject of spinal shock, for we know that if a patient is for a time severely paralysed by an injury and yet recovers motor power only one conclusion is possible—that little true anatomical damage had been inflicted, so delicate a reflector of injury is the cord. Indeed, it is this extreme sensitiveness that introduces all the difficulties of spinal shock.

Spinal Shock

In the fatal cases we can discover the extent to which the cord has been damaged, and we infer that there has been a lesion of like, but less, kind in the cords of patients who recover. This takes us but a short way in the solution of the immediate clinical problem presented by a patient just injured. We assume cord damage when we are faced with traumatic paralysis; we judge its degree by the extent and also by the quality of that paralysis. We recognize that the paralysis is compounded of both anatomical alteration (which may be small) and of abrogated physiological function (which may be large), two interdependent but separable entities, of which one does not appear without the other. At first the functional derangement overshadows the structural to such an extent as to make it difficult to know how much or little the other is, to know precisely what damage has been inflicted on the central grey mass, on the pyramidal and other long projection tracts. As we shall see, the sensory changes are a more reliable index of the extent of the lesion than are the motor. We shall inquire why this should be, as the problem has never before been stated. If the patient is unable to move his lower limbs are we to assume that his pyramidal pathways have been torn? Clearly not, for complete recovery may yet take place, as is proved not only by traumatic cases but by collateral observations on the effects of removal of spinal tumours. The paralysis is due to shock, to oedema, and in compression cases to local anaemia.

"Spinal shock" is a term introduced long ago by Marshall Hall as an explanation of the loss of reflex activities that follows spinal section. But as Sherrington soon showed that the condition affects only that part of the cord which is distal to the injury, and stated that it lasted only a few days, there is evidently something peculiar about it. The fact that it lasts as long as a few days makes it unlike "shock" in its ordinary surgical sense, and in actuality no one has ever ventured to define its exact duration. Every clinician knows that the state of reflex activity of the lower limbs alters over a long period, and voluntary movement (which is not included in the original pure physiological conception of spinal shock as studied in complete spinal sections) over longer periods still. In order to avoid the use of the word "shock" von Monakov introduced "diaschisis" to indicate depression or loss of synaptic function without any dogma as to its precise cause. It is known that other factors—cold, discomfort, pain, bleeding, low temperature, low blood pressure, infection—can all depress these activities without implying irrevocable damage to cell structure and connexions.

The problem has been further studied in the Oxford laboratories by E. G. T. Liddell,[8] whose work I have drawn on because it contains many very suggestive facts and speculations. Liddell divides shock into two parts: (1) true shock, a matter of hours or days at most; (2) "isolation-alteration" in Munk's term. It is chiefly this latter which Liddell has studied, the slow rise in excitability of the previously inert cord. It is often assumed that if a nerve cell is in connexion with an excitor fibre (such as one from the pyramidal tract) it will discharge on volition. Liddell stresses the importance of tonus impulses, the stream of subliminal impulses from varying sources (notably the vestibular nuclei) which are requisite for the maintenance of readiness to discharge. In the absence of these and of equally valuable "fringe effects" from other cells in the motor neurone pool a normal cell is not excitable.

Hoff's[4] estimation that there are 300 to 350 synapses (*boutons terminaux*) in relation to a single anterior horn cell in the cat (the number in the human is not at present known) emphasizes the influences to which a cell is subjected. It is easy, and no doubt correct, to assume damage to the long conduction paths in the spinal cord in a paralysed patient. But the point which must be made is this, that the inability to move may be due to temporary injury of other pathways besides, or other than, the pyramidal, and that because of the suppression of impulses carried by them the anterior horn cells at a lower level may fail to behave normally, either to willed movement or reflexly to stimuli. Thus a very profound atonic paralysis with absence of knee-jerks points to severe damage to the cord and complete abolition of the torrent of impulses from higher levels which normally pour into the cells of the central grey columns. In other cases reflex excitability is not abolished, and even slight voluntary movements may be possible from the first, with sensation also retained in some degree. In these cases the anatomical damage is probably slight and a good prognosis is justifiable. It will be seen that the state of paralysis alone is a difficult basis for estimation of damage.

The situation is different as regards sensation, which must next receive attention. Since the primary cell stations of sensation are outside the cord in the posterior root ganglia, spinal shock is unable to affect it adversely in anything like the same degree. If there is dense anaesthesia below the lesion there must be severe damage to all the sensory pathways and recovery will be rare, because this implies injury to the whole width of the cord. In less complete injuries from the first the sense of touch may be retained, though perhaps impaired, because there

are no intramedullary cell stations in its path that can be affected by shock. Touch uses long fibres coursing up the posterior columns and will be interfered with only by oedema causing pressure or by axonal fibril fractures. Pain and temperature senses are more apt to be interfered with owing to the more complicated synaptic nature of their transmission. Thus it comes about that a patient with a partial lesion may have very little power of movement, because of the complex nature of the maintenance of the normal excitatory state in the spinal nerve cells, and yet have relatively good sensation in the paralysed limbs, sensation being less susceptible to the phenomena of "isolation-alteration." This anomaly is explained by the facts laid down above and explains why sensory tests are the more reliable in deducing the extent of the lesion, and therefore the prognosis. The value of sensation as a criterion is well brought out in C. P. Symonds's contribution to expectancy of recovery.

Cervical Injuries

In none of my own cases of fracture of the atlas (seven clinical examples) has there been any cord injury, and in only two of the cases of fracture of the odontoid process (nine cases); nor has there been cord involvement in any of those curious and interesting vertical fractures of the axis which I described some years ago. The cervical group, excluding these two, comprises thirty-six patients, of whom seventeen died. It is important to particularize what differences there were in the neurological state of the recoveries when first seen in contrast with those where death followed.

Of the recoveries, in six there were cervical dislocations with root injuries only, and, as might be expected, all did well as concerns life, and all but one neglected case as regards function. In three patients there was "haematomyelia" without demonstrable vertebral injury—all recovered. In addition, there were ten patients with more or less severe injury to the cord who eventually regained a considerable or well-nigh complete use of their limbs. What was there in the immediate condition of these patients to differentiate them from the others who died?

In all there had been an immediate virtual quadriplegia, numbness of the whole trunk and limbs, but not a complete anaesthesia, usually with a feeling of "pins and needles" in the hands and arms; but in all there was some return of function within the first twenty-four hours, Often it concerned one leg, the other leg and both arms recovering to a lesser degree or, at first, not at all. In several there was no urinary retention. The patient, therefore, though badly damaged, is at the end of a day, or less, in possession again of some of the powers that he had lost, and when that is so the prognosis should be good. However, four of the fatal cases were severely but incompletely paralysed and none the less died within the next two or three days. Increase in the severity of the lesion can therefore occur, and is due, so far as one can dogmatize on something incapable of proof, to increase of oedema in the injured segments and surrounding tissues. Since all of these cases were fixed in one way or another, it is unlikely that further trauma was the reason for their death. Although in all of my own cases it has been the fact that a heavy and deep injury has always been fatal, it cannot be assumed that this will invariably be so. Information on this head is difficult to obtain. A. S. Taylor[10] has reported one case which was as completely paralysed as any of mine and anaesthetic below the sixth cervical segment and yet recovered; the exact state of sensation is not described. Similar experiences may have befallen others. More authenticated descriptions of such cases are required.

Case Reports

A résumé of the recoveries follows. The nature of the sensory loss in each is interesting.

CASE I

A. B., aged 16, after a diving accident was unable to move; there was numbness and loss of function in the hands. In a few hours he could move the left leg a little; the right leg and both arms were paralysed, apart from slight power of closure of both hands. The sense of touch was reduced over the left side of the trunk and the left lower limb. Five days later joint sense was good in both lower limbs, but pin-prick and temperature sensations were impaired below the eighth dorsal segment on the left side. Touch was recognized everywhere except on the hands in the eighth cervical segments, but less on the left than on the right below the eighth dorsal segment.

Comment.—There was local damage to the eighth cervical segment, with the right pyramidal tract involved temporarily after an initial period of complete suppression of all movement due to spinal shock. The right spinothalamic tract was injured incompletely, and probably also the left posterior column. This patient made a complete recovery, and six years later was able to do anything save for slight residual weakness of the right hand.

CASE II

C. D., aged 43, fell downstairs and dislocated the fifth on the sixth cervical vertebra. There was severe pain in the neck radiating down on to the shoulders with immediate complete paralysis, but in a few hours the left leg could be moved and the right a little. The bilateral paralysis of the arms was associated with anaesthesia down the inner sides of the arms to the little fingers. Below the lesion touch and pin-prick were both felt; hot and cold were not distinguished, both felt warm on the left side below the second dorsal segment. The tendon reflexes were present and there was no incontinence.

Comment.—This patient twelve years later was ambulant, but the injury to the grey matter at the eighth cervical segment left him with permanent dysfunction of a mild grade of both hands. The right leg remained weaker than the left. There was evidence of a partial impairment of temperature and pain sense on the left (Brown-Séquard), but the posterior columns were normal.

CASE III

D. E., aged 55, fell eight feet and sustained a crush fracture of the third and fourth cervical vertebrae. Immediate quadriplegia developed, and he was numb from the neck downwards. Sensation of pins and needles appeared within an hour and a flicker of movement returned to the left leg and, in a few hours more, to the left arm. At the end of three days the movements of the left leg were vigorous, and were present but less active in the left arm, except for the fingers. The right arm and leg were still paralysed; there was no incontinence. Cotton-wool was felt over both lower limbs; joint sense was present on the left, absent on the right, side. Pin-prick sensation was sharper on the right side and dulled on the left below the seventh dorsal segment.

Comment.—This patient made an excellent recovery, and five years later can walk ten miles. The right hand is still slightly weak. Once again there is evidence of local damage to the anterior horn cells of the seventh and eighth cervical segments (in spite of the high level of the vertebral injury), and to the spinothalamic tract of one side, and posterior column. The pyramidal lesion cleared up, leaving as its only trace slight overactivity of the tendon reflexes on the right side.

Space does not allow of fuller details of these or of an analysis of other cases. In general plan all were the same: there was evidence of local contusion of the cervical enlargement; paralysis of the legs with rapid recovery of one, slower of the other; retention of crude sensation on both sides but a definite clean-cut sensory level, often several segments lower, below which pin-prick and temperature sense, together or dissociated, were impaired or

lost. This bears out perfectly the suggestions made in the section on spinal shock as to what would be likely to happen in incomplete lesions of the cord. On the other hand, in the fatal cases there was a profound paralysis below the level of the lesion, with flaccid paralysis of the legs and to a varying extent of the arms ; diaphragmatic breathing only ; retention of urine ; and sometimes priapism. The worst sign of all is a dense anaesthesia up to the level of injury. Bilateral miosis was present in many, and is a bad sign, because the intramedullary cervical sympathetic is deeply placed, therefore a Horner's syndrome points to extensive central damage. The level of the vertebral never corresponds accurately with the neurological injury, but root pain usually indicates the highest level. Thus in a dislocation of the fifth on the sixth cervical vertebra the sixth roots are squeezed in the intervertebral foramina and pain radiates down into the radial borders of the forearms. At times the neurological level is distinctly higher than the vertebral, a fact due not only to the spinal segmental levels being from above increasingly higher than the vertebral, but also to spreading oedema in the cord. Two points make it difficult to give a standard neurological picture for an injury at a fixed and recurring level: (1) the muscles of the arm are represented in the cord as vertical columns of nerve cells which overlap several segments and our commonly accepted segmental supplies are averages which we use, and satisfactorily as it happens, to cover up the difficulties of the actual physiological arrangement ; (2) the cord contusion is inclined itself to be irregular.

Possibility of Survival

Two of the patients died in hyperthermia with temperatures of 107° F., the precise meaning of which is not known, but it suggests the release of temperature control by the cutting of autonomic pathways as surely as does hyperthermia following a pontine haemorrhage. In general the temperature in severe cord injuries is low, in fact it may be the lowest ever recorded in the human subject in these climes. Gordon Holmes[5] observed several patients with gunshot wounds of the spine whose temperatures were 80° F. or lower, and at the same time found a remarkable associated bradycardia and mental apathy ; in one of his cases the pulse rate was 22, in another it was 32 when the mouth temperature was 80.6° F., 102 when the temperature rose to 98.8° F. There are likely to be many more factors bringing about the death of the patient than we are yet aware of, upsets of visceral circulation and metabolism of direct or indirect neurological origin that make recovery impossible, quite apart from the more obvious difficulties of pulmonary ventilation arising from the partial paralysis of respiration. The oliguria noted by Holmes points in the same direction. The majority of these patients die within the first three days, sometimes from associated injuries, more often for the reasons just given. Occasionally a longer survival is seen ; two women lived, respectively, two and thirteen months completely paralysed below the seventh cervical segment and without the smallest sign of recovery. An even more astonishing survival was that in a case seen with G. R. Girdlestone—a woman of 30, with complete cord injury at the same level who had survived for six and a half years. She had had urinary infection, stone formation, spontaneous rupture of a peri-renal abscess, then a urinary fistula in the loin a year after the accident, but had got over all that, and but for troublesome pain in the radial parts of her hands was as well as a completely paraplegic patient could be. As we are often asked to give a prognosis in the first few hours it is well that we should be aware of the possibility of such survival, useless and distressing though it is.

Subjective Feelings in the Limbs

Interesting points emerge from questioning patients with complete cord lesions on the feelings experienced below the level of injury. It might be imagined that they felt nothing at all below the lesion, as if the body had been amputated. But the use of that word will at once raise speculation, for we know that "phantom limbs" are the rule. Do not "phantom bodies" also occur? Certainly they do, for the subjects are well aware of their lower limbs, and often feel them to be drawn up at the knees when actually they are flat on the bed. These limbs may feel to be hot or cramped, no doubt from impulses arising in the damaged area of the cord. The grey matter in the root entry zone can excite pain, and equally so, perhaps, other parts of the substantia grisea. The sensations felt in the lower limbs can confuse the patient when he is being tested clinically, so care must be taken to discount errors that may arise in this way.

Thoracic Injuries

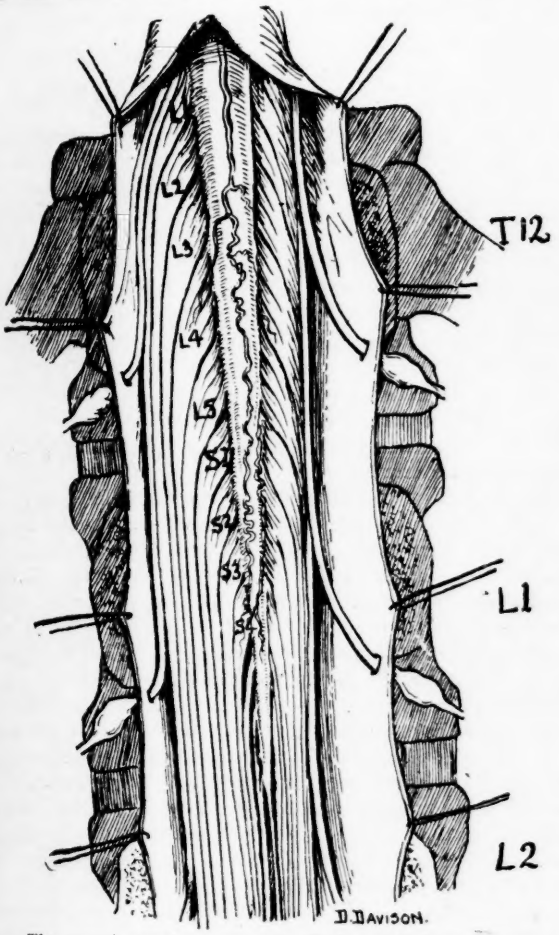
Of these injuries, fourteen in number, of the thoracic spine between the first and the tenth dorsal vertebrae, I shall say little. Three died within the first ten days. In every case there was a complete lesion except in one ; that patient had a crush fracture of the fifth thoracic vertebra and a cord lesion, incomplete from the first, rapidly recovering. The vertebral injury was reduced by the Watson Jones[7] method, and the patient made an admirable recovery. Of the rest some died months later, while one is known to be alive and totally paralysed below the eighth dorsal segment seven years after the accident.

Lumbar Enlargement

This is a very important group, and includes injuries of the eleventh dorsal to the first lumbar vertebrae, which have been admirably studied by G. Riddoch.[9] These are unquestionably the commonest forms of spinal injury in industrial districts and, as I have pointed out before, their incidence varies with different hospitals according to the character of the industries of the population surrounding it. For example, in 100 cases observed by Atha Thomas[11] the cervical spine was damaged in four, the lumbar in sixty. Thoraco-lumbar fracture is essentially a fracture of those engaged in heavy industries, especially in coal-pits and at docks. I have had twenty-two cases of injury of the thoraco-lumbar region with cord injury, of which only one died immediately. This was a case of flexion injury ; at necropsy the stomach, spleen, and intestine were found to be herniated into the left thorax through the torn diaphragm. Two others died in hospital: one hopeless paralytic of urinary sepsis, the other of embolism ; the remaining eighteen cases recovered. Some of these latter are since dead. Clearly the whole problem depends on the degree of neural damage, which can be a very variable factor with fractures at this level. In order to illustrate this I must speak of the relationship of the lumbar enlargement and conus to the spine. The particular point of importance is this: what are the structures which lie opposite the twelfth thoracic and first lumbar vertebrae, those most often injured? The lumbar enlargement begins above at the tenth thoracic vertebra and reaches its greatest diameter opposite the twelfth, from which point the cord tapers away to end at the lower border of the first or the upper border of the second lumbar vertebra. The structures opposite the first lumbar vertebra are the conus and all the sacral group of nerves arising from it. Therefore an injury limited to the first lumbar vertebra might produce anaesthesia in the classical saddle area of the perineum and gluteal regions (third and fourth sacral segments), with bands of anaesthesia down the legs to

the feet (second sacral segment), from contusion of the extreme end of the cord proper. The motor weakness would fall chiefly in the legs below the knees, and disturb also the control of the bladder and rectum. But alongside the conus and the nerves that arise from it are all the lumbar nerves downwards from the first lumbar nerve, which is emerging at the lower border of the vertebra. Thus with the most severe injuries to this vertebra damage to these roots is added to the medullary injury, and the lower extremities are put completely out of action. The first lumbar nerve, in spite of its theoretical vulnerability in fractures of that vertebra, often escapes injury, as is evidenced by a characteristic tongue-shaped area of normally sensitive skin on the upper end of the thigh, the lower limit of the territory of this nerve.

Opposite the twelfth thoracic vertebra lie the origins of the third, fourth, and fifth lumbar nerves. The



The neural structures opposite T.12 and L.1 vertebrae.

highest level of injury which can ordinarily be inflicted in fracture at this level is the twelfth thoracic, and since at this level the cord is considerably thicker the chances are that medullary damage will preponderate over root injury. This is well seen in the comparison of the actual results of lesions at the two levels, near together though they are. When the injury implicates the twelfth thoracic vertebra the paralysis which follows has commonly been lasting. Of seven cases only one made a good recovery, was ambulant, and lived for fourteen years. This is similar to the results of injuries at higher thoracic levels. When it is the first lumbar vertebra which is damaged the prognosis improves greatly, and of ten injuries at this level five did very well, three died, one, two, and seven and a half years later, while two died in hospital from complications.

Nowhere else in the cord does sensory loss give such precise information as in these lumbar injuries. In the worst cases the anaesthesia may be as high as the twelfth dorsal segment on the lower abdomen, but more often it leaves the first lumbar segment uninjured, and one gets the characteristic tongue-shaped areas of sensitive skin at the groins and down over three inches on to the thigh. As the injury is less and less serious so the anaesthesia is of smaller and smaller extent, and in the least serious examples one finds a small saddle area of anaesthesia on the perineum as the only neurological sign apart from disturbance of visceral function. In these last cases the knee-jerks will be present, but very likely the ankle-jerks will be absent. It is possible for a patient to retain extremely good movement in the lower limbs and yet have a neurological lesion of small size such as this, a lesion that may easily escape detection in its earlier stages, though sphincteric difficulties will soon draw attention to it. It is a gratifying experience to discover how well patients will, as time passes, accommodate themselves to these visceral difficulties and, in the end, overcome them.

Bladder and Rectal Disturbances

Recently this subject has been considerably illumined by the work of Denny-Brown and Graeme Robertson[2] and of Watkins.[12] In all severe spinal lesions, high or low, cord or cauda equina, the immediate result is always retention. It is only later that the fundamental differences become manifest. In cervical and upper thoracic lesions the emptying of the bladder regains, after days or weeks, qualities of massive emptying not unlike the normal, save that it is uncontrollable. In conus and cauda equina injuries detrusor action is feeble, and the bladder can only be emptied by straining—an entirely abnormal method, for normal micturition is initiated by an active inhibition of the muscles of the urinary passages, which sets going a steady contraction in the bladder wall. The alteration from normal is a useful one for the patient, as it enables him to keep himself dry. But before these stages are reached the patient must survive a danger period of retention. How is this to be managed? In the present series an indwelling catheter has been the routine method. It is true that some degree of infection is invariable when a catheter is installed. Catheterization, intermittent or continuous, is said to cause a high mortality in these injuries. This has not been so in these cases, and no patient who might otherwise have recovered has died of urinary infection. Connors and Nash[1] urge that the bladder should always be allowed to overflow, even if it needs thirty-six hours to do so; they state that no bladder has ever ruptured spontaneously if left alone. This latter generalization is probably untrue, and the fact is that few patients will tolerate the pain of over-distension. Moreover, if once over-distension occurs it is impossible to express urine without risk. All will agree that catheterization ought to be avoided, and we all, probably, try to avoid it, but few of us, I feel sure, succeed.

As for the rectum, Denny-Brown and Robertson[3] showed that the external voluntary sphincter is not ordinarily in action, and is used for voluntary retention only under necessity. Normally the rectum is closed by the tonus of the internal sphincter and smooth muscle in the levator ani, which acts reciprocally with the rectal musculature, relaxing when the latter contracts. But as the rectum only normally voids at considerable intervals the patient with paralysis may get along quite comfortably (compare the colostomy patient). He lacks expulsive power if the abdominal muscles are unable to assist, and he may soil himself from loss of control of the striped muscle sphincter (including levator ani) if he gets loose stools by ill-advised purgation. A man may therefore

become ambulant after a pure conus or cauda equina injury, and yet be able to go about much as he desires when he has learned the precautions necessary to his state.

Treatment

The immediate treatment of all cases will be decided upon after a survey of the neurological signs, and of lateral radiographs of the spine. In cervical injuries good pictures of the lower end of the region are not easy to obtain, especially when there is a complete and high cord injury, because the shoulders are commonly elevated abnormally by the unopposed action of the trapezius and levator scapulae muscles. This can be overcome by the taking of stereoscopic oblique views of the thoracic inlet. Without exact information of the injury it is impossible to proceed. In general it is, of course, proper to reduce the dislocation, if one is present, but it must be observed that crush fractures without notable displacement sometimes occur in the cervical region as well as lower down, and call for nothing more than immobilization followed by plaster. As for the dislocation, some have been reduced by manipulation under anaesthesia, others by slow traction. I have not been favourably impressed by the method of reduction described by Taylor[10] of New York, although he got good results himself, in which great tractive power is developed by means of pulleys. I have reduced one case by this means, completely failed with another after two attempts, and in a third I believe the cord injury was made worse.

The difficulty in any method is to get the traction in precisely the right plane, without at the same time risking forward tilting of the upper fragment. The neck is so mobile at the point of dislocation, below the level as well as above it, that the lower fragment tends to be uncontrollable. Plain backward extension is equally not without danger. I feel sure that the safest plan is to try for slow reduction by fixing the head to the top of the bed and using the inclined body weight as the reduction force. I have no experience of the ice-tongs method advised by Coleman and by Mackenzie, applied after making small superficial burr holes in the skull. Whether this is less irksome than the collar encircling below the chin and occiput is debatable, but intrinsically it is a sound method. It is certain that complete reduction is not easily achieved, or once achieved is not readily maintained. Most of my own cases and those of others that I have seen have been imperfect, though perfect examples have been obtained.

I shall leave the discussion of the treatment of the thoracic and lumbar injuries in other hands. There is no doubt that the Watson Jones[7] method is admirable in its results on the vertebral injury. So much must at once be admitted. The point that we have to discuss is whether it is an equally good method when there is neural damage. Its advantages are that it will reduce the bony displacement provided that that is not of too extravagant a kind, and that it will be likely to relieve the cord of pressure. But no method, however skilfully applied or resolutely carried out, will restore function to a severely injured cord—which means to a patient with a densely anaesthetic body. The advantages of reduction are that if the patient recovers he will be freed from the painful back which so often disables the workman. Against reduction are two points: (1) the fear of pressure sores in anaesthetic areas, and (2) the plaster case compels catheterization whether we like it or not. The best plan, in my view, is the making of a plaster bed for the severer cases, to be followed in a week or two by a plaster case if the improvement warrants it. This obviates the dangers of immediately enclosing a paralysed and anaesthetic patient, and so preventing any variation in treatment or observation of alteration in sensory levels.

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PULMONARY TUBERCULOSIS IN YOUNG ADULTS*

SIGNIFICANCE OF CONTACT HISTORY

BY

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AND

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The serious nature of pulmonary tuberculosis developing in young adult life was clearly shown by A. S. MacNalty in 1932 in his report on tuberculosis,[1] in which he stated that "towards the end of childhood and in young adult life . . . approximately one-third of the deaths from all causes in males, and almost one-half of the deaths from all causes among females, are due to tuberculosis, chiefly of the pulmonary form." The problem of young adult tuberculosis has been and is being attacked from many angles, and we, in our present investigation, have attempted to ascertain the significance of certain of the aetiological factors, with special reference to the history of contact with persons known to be suffering from pulmonary tuberculosis.

The histories of 1,000 patients between the ages of 15 and 25 years in whom a diagnosis of pulmonary tuberculosis had been made have been carefully examined. In the case of those with a history of contact with any person suffering from definite pulmonary tuberculosis we have noted whether this person was: (*a*) one of the family—parent, brother, or sister—or other relative; (*b*) a friend in the same household or not; and (*c*) a fellow-worker with whom there had been close association. So far as was possible information has been obtained of the details of the length and degree of exposure to the infection, the age of the patient when thus exposed, and the early symptoms which led to the diagnosis of the disease. Other points of possible aetiological significance have been noted—namely, type of occupation, hours of work, and mode of travel to work.

Of our series of 1,000 patients suffering from pulmonary tuberculosis 663 had tubercle bacilli in the sputum and the remainder had definite clinical and radiological evidence of the disease; no patients with a doubtful diagnosis or with pleurisy alone were included in the series. Apart from this there was no selection of material.

We found, in recording the family histories, that a number of patients were ignorant of the cause of death of even their near relatives, or else were content with such terms as "asthma," "bronchitis," "pleurisy," or "congestion of the lungs." Although some of the diagnoses were suggestive of pulmonary tuberculosis, we have included these patients in the "non-contact" group, and have also put in this group those (twenty-six) cases with a family history of meningitis or surgical tuberculosis only. In all those who were exposed to infection outside the household contact had been definite and repeated. The contact group, therefore, includes only those patients with

* The expenses of this investigation were defrayed by a grant from the Halley Stewart Trust.

an unmistakable history of contact with a definite case of pulmonary tuberculosis.*

The series consists of 634 females and 366 males, and the majority of cases in both sexes were diagnosed between the ages of 18 and 23 years.

Results

The results of the first part of the investigation, as seen in Table I, show that 396—that is, roughly, 40 per cent.—of the patients gave a history of contact with a case

TABLE I

	Contact	Non-contact	Total
Males	131 (36 %)	235 (64 %)	366
Females ...	265 (42 %)	369 (58 %)	634
Total ...	396 (3.96 %)	604 (60.4 %)	1,000

of definite pulmonary tuberculosis previous to the onset of their disease. In similar investigations by other workers the percentage of patients having a history of contact in the family or household was 41 of 3,000 patients at Hauteville Sanatorium[2] (Stephani-Cherbuliez), and 36 of 500 dispensary patients at Leeds[3] (Tattersall).

Unfortunately we do not know of any published figures for the contact history in the 15 to 25 age group of the general population for comparison with our figures, and any attempt at comparison with histories of patients with diseases other than tuberculosis attending the Brompton Hospital would give an erroneous conclusion, since many of these sought advice on account of a family history of tuberculosis. However, since about forty out of every 100 cases of young adults with pulmonary tuberculosis were known to have been exposed to infection, we consider that a history of contact with the disease is of definite aetiological importance and justifies a more detailed study.

Details of Contact History

History of a known case of phthisis in the household was found in 82 per cent. of all the contact cases, and outside the household in 18 per cent. of the cases.

In Tables II and III the different relationships of the household contacts are shown. From these it is evident

TABLE II

Source of Infection		Number of Cases	Per 100 Contacts	Per 100 Total P.T. Cases
Household	Mother	66	—	—
	Father	119	—	—
	Total parents	—185	46.7	18.5
	Brother or Sister:			
	Same sex	71	—	—
	Opposite sex	56	—	—
	Total same generation	—127	32	12.7
	Friends or other relations	14	3.6	1.4
	Total in household ...	326	82.3	32.6
Ex-Household	Friend, fellow worker, or other relation	70	17.7	7
		396	100	39.6

that contact with tuberculous brothers and sisters occurred in 32 per cent. of the contact cases, and contact with tuberculous parents in 46.7 per cent. Therefore the older generation was by no means responsible for all the known tuberculous infection in the family, but infection was apparently introduced in many cases by a brother or sister from a source outside the home. These figures may be misleading because undetected lesions in the parents may exist, but, for practical purposes, the history of contact in the same generation is an important factor, especially if we consider that there were, in our series, 60 per cent. of patients with no history of contact who definitely did thus introduce new sources of infection into their families. Contact with tuberculous brothers and sisters was also found frequently by Tattersall; in his series of 181 young adults with pulmonary tuberculosis with a history of contact in the family seventy-eight were known to have tuberculous brothers or sisters, thirty-five to have tuberculous parents, and thirty-two to have tuberculous parents *and* brother or sister.[3]

Another point of interest brought out in Table III is that, taking the parental contact group as a whole, exposure to tuberculous fathers was almost twice as frequent as exposure to tuberculous mothers, although this difference was less marked among the young adults who developed the disease between the ages of 16 and 20 years. Tattersall's figures again support our findings, as in his series the number of young adults with tuberculous fathers was twenty-seven, and with tuberculous

TABLE III

Age at Onset	Household					Ex-household	Total
	Mother	Father	Brother or Sister	Friend or Relative	Total	Friend, Fellow-worker, or Relative	
16–20 yrs.	41 (21 %)	57 (29 %)	60 (31 %)	7 (3 %)	165 (84 %)	32 (16 %)	197
21–25 yrs.	22 (12 %)	56 (31 %)	61 (33 %)	7 (4 %)	146 (80 %)	37 (20 %)	183
15 yrs. ...	3	6	6	0	15	1	16
	66	119	127	14	326	70	396

mothers seventeen. The importance of exposure to tuberculous fathers was suggested in a previous investigation carried out at the Brompton Hospital[4] in which it was found that the incidence of tuberculous infection was slightly higher in children with tuberculous fathers than in children with tuberculous mothers. In contrast to this, the mortality rate from tuberculosis in young children is higher among those with tuberculous mothers than among those with tuberculous fathers.[1] The significance of these facts is difficult to assess, since many aetiological factors are involved, but the problem might with advantage be further investigated.

Interval between Contact and Onset of Disease

Although the duration of exposure to tuberculous infection is no doubt of importance, we could not feel sufficiently confident of the accuracy of the alleged date of onset of the disease in the person presumed to be the source of infection to draw any conclusions from this part of the investigation. On the other hand, the period between the last known exposure to infection and the onset of disease in the patient could be ascertained in all but three of the 396 cases. The remaining 393 fall into two groups: (1) those who were exposed to infection at the onset or within one year of the onset of disease; and (2) those who were no longer exposed because the individual who was the source of infection had been removed from the patient's environment or had died, or (in sixteen cases only) had become free from symptoms and was considered to be cured. Of the 393 cases 174 (44 per cent.) were known to have been exposed to infection

* Those accepted as definite cases of pulmonary tuberculosis were persons who either had died of the disease or had had treatment in a sanatorium.

within one year of the onset of the disease, the remaining 219 (56 per cent.) being free from contact with known infection for over one year.

TABLE IV

Interval between Last Known Infection and Onset of Disease	No. of Cases	Per 100 Contacts
Under 1 year...	174 } 313	44.2 } 79.6
1–5 years	139 }	35.4 }
Over 5 years	80	20.4

In Table IV the cases are divided, according to the period of freedom from infection, into three groups: (1) those known to have been exposed within one year of the onset of the disease; (2) those known to have been exposed within one to five years of the onset of disease; and (3) those who were free from known infection for over five years. It is seen that the first two groups contain the majority of the cases—namely, 313, or 79.6 per cent. In other words, in four out of every five of the contact cases the onset of the disease occurred either during exposure to infection or within five years of the last known exposure to infection.

Early Symptoms

Interrogation of the patients concerning the symptoms at the onset of the disease has shown such variations in the degree of apparent illness that an attempt has been made to separate the 1,000 cases into two groups, according to their early symptoms. In one group, which we have called the "non-toxaemic," are included those with a history of haemoptysis or chronic cough but with no malaise, night sweats, or wasting, and also those persons without symptoms in whom definite radiological evidence of disease was found on routine examination. In the other group are included the "toxaemic" cases—that is, those with constitutional disturbances such as malaise, lassitude, night sweats, fever, and wasting, and those whose first symptom was either so-called influenza or an acute attack of pleurisy.

Among the non-contact cases (see Table V) there is a definite preponderance of toxaemic over non-toxaemic

TABLE V

Interval between last known Infection and Onset of Disease		Type of Onset				Total
		Non-toxaemic	Toxaemic	Pregnancy	No History Obtained	
Contact	5 years and under	108 (34.5%)	194 (62%)	5 (1.7%)	6 (1.8%)	313
	Over 5 years	40 (50%)	32 (40%)	3 (4%)	5 (6%)	80
	Total...	148 (37.7%)	226 (57.5%)	8 (2%)	11 (2.8%)	393
Non-Contact		171 (28%)	421 (70%)	10 (1.6%)	2 (0.4%)	604

(70 per cent. toxaemic and 28 per cent. non-toxaemic), and the contact cases, taken as a whole, show roughly an equal number of each type. However, on dividing the contact cases according to the length of interval between the last known exposure to infection and the onset of the disease, we find that in Group 1, in which this interval was five years and under, there is a preponderance of toxaemic cases (62 per cent. toxaemic and 34 per cent. non-toxaemic), and in Group 2, with a period of freedom from known infection of over five years, there is a slight excess of non-toxaemic cases (50 per cent. non-toxaemic and 40 per cent. toxaemic). Although this division of the patients according to the history of their symptoms can at best be only a rough guide, yet these figures seem to suggest that the type of tuberculosis with toxaemic symptoms at the onset is the predominating one among the non-contact group of our cases; whereas among those who have not developed clinical tuberculosis until at least five years after the last known contact there is a relative increase in the number who develop the type of disease in which the onset is less acute. In a small way these differing reactions are a reflection of what appears in the history of certain races. Lyle Cummins has shown that South African natives, to whom tuberculosis is a comparatively new disease, develop an acute toxaemic form of tuberculosis.[5] In China the opposite condition is found, for there tuberculous infection has been known to exist for centuries, and the disease develops insidiously and often without any evidence of toxaemia.[6]

In the toxaemic group, in 35 per cent. of the cases, the first symptom was so-called influenza (19 per cent.) or pleurisy (16 per cent.). According to the last report from the Research Department of the Brompton Hospital,[7] early lesions were demonstrated in 0.5 to 1 per cent. of the adolescent population who had no more suggestive symptoms than these. Is it not worth while subjecting young people who suffer from these ailments to an examination more searching than is usual, to exclude the possibility of pulmonary tuberculosis?

Occupation

The occupation of the young adults in our series was another aetiological factor investigated. Of the 1,000 young adults with pulmonary tuberculosis 3 per cent. had no occupation, 7 per cent. were married women, and the remainder were employed at the onset or within a few months of the onset of illness. Most of them were working in offices or factories and workshops, these employments being responsible for 44 per cent. of the total.

A comparison between the occupations of the 1,000 tuberculous patients and 400 patients with no evidence of tuberculosis showed that there were 12 per cent. more office workers in the tuberculous group than in the non-tuberculous group. Although this is not a striking difference it is appreciable compared with the other occupations, whose incidence was remarkably similar in the two groups, except, perhaps, in the case of domestic servants, who were found less frequently among those with pulmonary tuberculosis (Table VI).

It was not possible to make any statistical estimation of the conditions of travelling, but our impression was that on the whole these were distinctly worse for the clerical workers than for the factory hands. There was a tendency

TABLE VI

Occupation	Per cent. P.T. Cases	Per cent. Non-tuberculous Cases
Office	23.8 (238)	11.5 (46)
Domestic service	5.7 (57)	11.0 (44)
Factory or work-shop	20.0 (200)	19.5 (78)
Retail shop	10.1 (101)	13.5 (54)
Dressmaking, millinery or tailoring	7.4 (74)	8.0 (32)
School or university	3.3 (33)	4.9 (19)
Hospital nursing	3.2 (32)	2.7 (11)
Other occupations...	16.1 (161)	18.2 (73)
No occupation	3.2 (32)	4.8 (19)
Married women	7.0 (70)	6.0 (24)

for the latter to find employment near home, many of them walking or bicycling to work and returning home to their midday meal. Many of the office workers, on the other hand, had long journeys at the rush hours in conditions which must tend both to lower resistance and to facilitate the spread of any infection. An interesting statement concerning this subject was published in a recent report of the Industrial Health Research Board:[8] in clerical trades and light industries it was found that the factory worker had a lower rate of sickness than the clerical worker.

Conclusions

1. Contact with pulmonary tuberculosis is an important factor in the aetiology of pulmonary tuberculosis in young adults, and therefore it should be possible to detect the disease in its early stage in many instances by examination of all those with a history of such contact.

2. About four out of every five of young adults suffering from pulmonary tuberculosis who have been in contact with a known case of infection develop the disease within five years of exposure to the last known contact with infection—a fact which stresses *the value of continuing the observation of contacts for at least five years after they were known to be last exposed to infection.*

3. There is a history of household infection in 82 per cent. of the contact cases.

4. History of exposure to tuberculous fathers is almost twice as frequent as history of exposure to tuberculous mothers.

5. In about half of the contact cases spread of infection is not obviously due to transmission of the disease from parent to offspring, but in many cases infection is apparently introduced into the household by a brother or sister.

6. It is important to realize that 60 per cent. of the young adults who develop pulmonary tuberculosis are unaware of any contact with the infection.

7. In non-contact cases the toxaemic type of onset is more common than the non-toxaemic (70 per cent. *versus* 23 per cent.). If all classes of contact cases are taken together the toxaemic and non-toxaemic types of onset occur in about equal proportions. It appears, however, that if there is an interval of over five years between the last known exposure to infection and the onset of the disease the onset is more likely to be of the non-toxaemic type.

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R. Liberti (*Il Policlinico*, Sez. Med., August 1st, 1936, p. 400) states that the mortality among 143 cases of tetanus admitted to the Clinic for Infectious Diseases of the University of Rome from 1922 to 1935 inclusive ranged annually from 22 to 83 per cent., the average being 51 per cent. All the cases were treated by antitetanic serum administered by various routes, combined with bromide and chloral or morphine. Dufour's method of deep anaesthesia by ether or chloroform for at least half an hour, and repeated, was used in twenty-eight cases with a mortality of 50 per cent., which was higher than that of cases not so treated, while 35.6 per cent. died of bronchopneumonia as compared with only 1.8 per cent. of those not so treated. In conclusion, Liberti states that Cole's method of continuous avertin anaesthesia for several days deserves consideration.

RECENT OBSERVATIONS ON THE BIOCHEMISTRY OF THE LENS*

BY

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For this paper I have reviewed the work of the past three years in order to give an account of the more important observations on the biochemistry of the lens. Recently the search for the cause of cataract has been in three main directions:

1. The discovery of new methods of producing experimental cataract.
2. The investigation of general metabolic changes which may be associated with cataract.
3. The identification of new substances in the lens.

The results of these biochemical experiments are more closely related to clinical facts than they have been heretofore. For instance, among the new methods employed for producing experimental cataract are:

1. A disturbance of carbohydrate metabolism.
2. A deficiency of vitamins.
3. Investigation of hereditary cataract in animals.
4. The administration of toxic substances.

The first of these—that is, a disturbance of carbohydrate metabolism—is directly related to the clinical problem of diabetic cataract. The rapid changes in refraction which can accompany a rise or fall of blood sugar in the diabetic patient are well known, and it is generally accepted that the development of cataract in a young diabetic is a bad prognostic sign. It is interesting to note that Chaikoff and Lachmann (1933) found lens changes in eight out of ten dogs which had been made diabetic by the removal of the pancreas, and had been kept in good health for periods up to two years by the administration of insulin. The lens opacities varied from peripheral striations to diffuse irregular opacities resembling early senile cataract. The development of cataract bore no relation to the duration of the diabetes nor to the age of the dog. The animals were receiving a full protein and vitamin diet.

Carbohydrates and Cataract

Mitchell and Dodge (1935) accidentally observed mature cataract in three rats which were on a diet containing 70 per cent. lactose, and proceeded to a full investigation of the effects of a high carbohydrate intake. All of the rats given this diet showed lens changes, which in about half of them developed into mature cataract in some ten weeks. The addition of calcium gluconate had no appreciable effect. With lower percentages of lactose the cataract developed more slowly and fewer became mature. Rats subjected to the diet at an early age—that is, under 30 days old, were more susceptible than older rats. Diets containing 70 per cent. of starch, dextrin, or maltose, or 50 per cent. of sucrose or maltose, had no effect on the lens. The lens opacities appeared either as a zone of defraction round the nucleus, followed by nuclear opacity, or began as flake-like opacities in the anterior cortex. It is interesting to find that there was an increase of calcium content in the eyes which developed cataract, but no corresponding changes in the calcium content of the blood or bones.

Lactose has some association with calcium metabolism, and it is said to aid the absorption of calcium from the intestine (Bergeim, 1926) and to have a favourable effect on the calcification of rachitic bones, so that it is quite possible that this sugar has some effect on the permeability

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of the lens capsule. Rats on lactose excreted in the urine a large amount of sugar which appeared to be galactose, a simple sugar which can be obtained from lactose by hydrolysis.

Rats are known to absorb galactose more rapidly than other sugars (McCance and Madders), and there is some evidence that galactose has a more marked effect on the lens than lactose. Mitchell (1935) found that rats fed on a diet containing 35 per cent. galactose developed mature cataract very rapidly—actually in about nineteen days; they also showed marked galactosuria and an increase of calcium in the eyes. Yudkin and Arnold (1935) have performed similar experiments on albino rabbits and obtained results confirming those of Mitchell and Dodge. With 70 per cent. dextrose the lenses were clear and the blood calcium was normal, while the latter was slightly raised on a galactose or lactose diet. They found that on galactose young animals formed nuclear cataracts, whilst older animals developed cortical cataracts. They suggest that galactose may have a direct toxic effect on the growing parts of the lens, or that it may affect it indirectly by upsetting the calcium metabolism of the body.

The use of such high percentages of sugar to produce cataract is certainly open to criticism, but one must remember the high level often reached by the blood sugar in diabetes. The interesting effects of lactose make one wonder whether this sugar plays any part in the development of lamellar cataract, since it is normally present in the circulation during the latter part of pregnancy, and we know that the lens changes in lamellar cataract are laid down in embryonic life.

Effects of Vitamin Deficiency

If we now turn to the effects of vitamin deficiency we must remember that in the past few years the vitamins have increased in number and complexity. They are no longer the three simple substances A, B, and C. Vitamin A has a direct connexion with night-blindness. B is subdivided into several factors, of which B_2 (or G) and lactoflavin are of importance in the investigation of cataract, while vitamin C has been identified with ascorbic or cevitamic acid (Szent György), and has been found to be present in the lens in amounts varying with its pathological condition. It is well known that a deficiency of either A or G will produce a keratitis.

In the experimental production of cataract there are only a few instances of obtaining it as a result of a deficiency of vitamin A. Blackberg and Knapp (1934) said that puppies on a rachitogenic diet developed not only dental caries and conical cornea (a combination of symptoms found to occur clinically), but that on a later date the sutures of the lens became very marked, and discrete opacities appeared which finally developed into mature cataract after six months. They ascribe these changes to disturbance of the calcium–phosphorus balance brought about by the lack of vitamins. V. Szily and Eckstein found zonular cataract in the young of rats deprived of vitamin A, but Stepp and Friedenwald have failed to confirm this.

The effect of vitamin B_2 or G deficiency has been the subject of a large number of experiments. Langston and Day (1931 and 1934) in America have reported an incidence of 100 per cent. cataracts, which matured in an average of seventy-two days, both in albino rabbits and in rats deprived of vitamin B_2. They found that the appearance of cataract was delayed where small but insufficient amounts of B_2 were added, and this could be correlated with the rate of growth. Their results were so consistent that they concluded that the development of cataract might be used as a better criterion of vitamin B_2 deficiency than the one usually employed—namely, the appearance of dermatitis. Day, Langston, and Cosgrove also produced cataract in mice, chickens, and monkeys by the same means.

In contrast to these results O'Brien (1932) and Yudkin (1933) report that cataracts only occur in rats deprived of vitamin B_2 at an early age and not in older animals, while in this country Bourne and Pyke (1935) carefully repeated the work of Langston and Day and obtained an incidence of cataract of only 31 per cent., whereas dermatitis appeared in almost every case. Other observers—for example, Daniel and Munsell (1933) and Ray, György, and Harris (1935)—have also kept large numbers of rats for a long time on a B_2-deficient diet without any cataract developing. Nevertheless Bourne and Pyke are of the opinion that some dietetic factor may be concerned, and that the recent work of separation of vitamin B_2 into flavine and a subsidiary substance should facilitate the solution of the problem. In fact, Fischer (1935) has stated that flavine is present in the lens. Bourne and Pyke (1935) made one other interesting observation: that no cases of cataract occurred in a small number of rats receiving a diet deficient in B_2 but to which there had been added 1 per cent. cystine, a substance which normally abounds in the lens but which is absent in cataract.

We associate lack of vitamin C with the production of scurvy, and Monjukowa and Fradkin (1934) appear to be almost the only observers who have found any lens changes associated with the lack of this vitamin. They reported six cases of clouding of the lens out of twenty-five scorbutic guinea-pigs, and stated that puncture of the anterior chamber led to a rapid development of cataract, whereas in normal animals this did not appear. Further, lens opacities occurred on the second day after birth in young guinea-pigs whose mothers had been deprived of vitamin C during pregnancy. Bellows (1936) failed to observe lens changes in guinea-pigs which had been kept for two months on a vitamin C deficient diet, while Bietti (1936) found in guinea-pigs slight lens changes which were more marked if the diet was poor in cystine as well as in vitamin C. Vitamin C actually bears a more interesting relation to the metabolic processes of the normal lens, to which I will refer again later.

Hereditary Cataract

It is generally agreed that in all experimental work where stock animals—such as, rats—are used one has to guard against the appearance of hereditary defects. This is particularly the case where attempts have been made to produce cataract in young animals by the injection of lens extracts, or lens proteins, into the parent animal. Rabbits have been used more than any other animals, and they are specially prone to show hereditary defects of the eyes.

Noted observers—such as, Nettleship (1909), Bishop Harman (1910), Norman Bennett (1901), and Hornback (1932)—who have reviewed the subject of hereditary cataract, have pointed out that in man these cataracts are related to disorders such as deficient calcification and dentition, and muscular atrophies or dystrophies. Hornback's contribution to our knowledge is of special importance, since he has stressed the fact that hereditary cataract in man appears apparently as a dominant character, but with occasional lapses that are difficult to explain. It is transmitted in a way that can be explained, however, on the assumption that it is the *predisposition* to cataract which is transmitted as a true dominant character. Whether or not cataract itself develops depends upon the association of this predisposition with some other factor. A nutritional or endocrine disturbance may obviously constitute this other factor.

It is highly probable that the same is true in animals. V. Hippel has published an interesting account of a dominant hereditary cataract in dogs in which the lens changes began in embryonic life, while recently Bourne, Pyke, and I have been able to test the inheritance of cataract in rats. By the courtesy of Messrs. Bemax we acquired from their stock colony two adult rats which were normal, except that each had bilateral mature cataract. From them we have bred four generations of rats. The cataract appears to be inherited as a recessive character. It first begins to appear about two months after birth, and is associated with certain degenerative changes in the retina. We hope at a later date to give an account of its genetics and its histological and ophthalmological appearances. It certainly provides an excellent opportunity for testing the theory that the appearance of hereditary cataract is conditioned by nutritional disturbances.

Effect of Toxic Substances

We now come to the last of the methods of producing cataract—the administration of toxic substances. The effects of naphthalene and dinitrophenol are outstanding. The latter drug has recently been employed in America as a popular remedy for slimming, and since July, 1935, there have been a hundred or more cases recorded in which patients have suffered from marked deterioration of vision, beginning perhaps several months or even a year after they had ceased to take the drug. The loss of sight was found to be due to changes in the lens, which began as "brass-filing" or snow-flake opacities (Veasey, 1936) and within a few weeks rapidly developed into cataract. Spaeth (1936) describes a case in which complete liquefaction of the cortex occurred, and the lens was reduced to a number of particles floating in a milky fluid inside the lens capsule. This devastating effect may be due to the fact that dinitrophenol is said to cause a tremendous increase in tissue oxidation. In a review of twenty cases Cogan (1935) was unable to find any relation to the total amount or time of taking the drug, or to the loss of weight it produced. Most of the patients were young, the average age being 37, and some were taking only small doses under the care of a physician. Both Cogan and Spaeth have reported cases which showed symptoms resembling those of a parathyroid tetany, and Spaeth administered parathyroid extract with calcium lactate with benefit. Apparently the lens was the only part of the eye affected, as removal of the cataract restored the vision.

The work which I described a few years ago on the effect of naphthalene on the lenses of rabbits seemed academic, but it has suddenly acquired a clinical interest, in the light of these reported cases of dinitrophenol cataract, since the two substances are closely related chemically. It was generally believed that an aromatic hydrocarbon such as naphthalene could not be metabolized by the body, but Bourne and Young (1934) have made a discovery of great importance in showing that in rabbits naphthalene is conjugated with cystine and is excreted as l-α-napthyl-mercapturic acid. They not only isolated this substance from the urine of the rabbits, but were also able to synthesize the pure substance.

Such authentic chemical evidence is always of value, and since naphthalene causes cataract, and the lens is particularly rich in cystine-containing substances, such as β-crystallin and glutathione, it is tempting to adopt Bourne and Young's suggestion that the cataract caused by naphthalene may be due to the depletion of the lens of its store of cystine. In fact, Tsuji (1932) has shown that a naphthalene cataractous lens will no longer give a positive reaction for cystine.

Metabolic Changes in Cataract

With regard to the investigation of metabolic changes which may be associated with cataract in man, the ordinary constituents of the blood, cholesterol salts, sugar, and so on, have been estimated repeatedly without any significant difference being found in patients with cataract, although there is some slight evidence that the blood calcium may vary, particularly in endocrine cataract (Alajmo and Rubino, 1935). Very little is known, however, of sulphur metabolism, or of the relation it bears to the substances glutathione and cystine, either in the normal subject or in those with cataract.

As a preliminary investigation last year (Campbell, 1935) I estimated the glutathione in the blood of patients with senile cataract and in those with other ocular conditions, and found that there was no marked variation in the reduced glutathione content of the blood. It was also apparent that age and diet had no effect, even when the amount of sulphur ingested was varied from maximum to minimum by the use of high and low protein diets of the same calorie value. The oxidized glutathione of the blood was more variable but showed no significant change (Campbell, 1936).

Bourne and I also investigated the sulphur metabolism in a number of patients, and were unable to show any abnormality in those suffering from cataract. The investigation was a tedious one, as it involved numerous fractional analyses of the urinary sulphur and keeping the patients on controlled diets for several days. There was no indication of an increased output of neutral sulphur such as might be expected if cystine were being lost from the body, nor of any active detoxication as shown by the excretion of ethereal sulphates. The cataractous patients seemed to have as good a sulphur metabolism as the normal controls (Bourne and Campbell, 1936). Of course there may be some abnormality present which is not revealed by the methods of analysis now in use.

Bellows (1936) has investigated the vitamin C in the blood and has found that it is normally present in the amount of 1 to 2 mg. per 100 c.cm., whereas in cataractous patients it is slightly less. He also determined the response to an intake of vitamin C by giving 150 c.cm. of orange juice and estimating the vitamin C content of the blood immediately before and thirty minutes after the administration. This dose had almost no effect in the cataractous patients, but caused a slight increase in the normal; the vitamin C in the blood of cataractous patients could be raised after large doses had been taken for several days. In support of the theory that a vitamin C deficiency may exist, Harris and Ray (1935) have shown that, judging by the urinary output of vitamin C, a subclinical type of scurvy is not uncommon in adults, and this is, of course, more likely to occur among the poorer classes, in whom cataract has a higher incidence.

Chemical Reactions in the Lens

This leads us to a consideration of the lens itself, for it has been demonstrated recently by many observers that its reducing property is not wholly due to glutathione, as was supposed, but is due also to vitamin C, of which it contains a relatively large amount. According to Muller and Buschke the lens contains 30 mg., while the aqueous humour contains about 12 mg. per cent. of vitamin C, as contrasted with the blood and cerebro-spinal fluid, which contain only a small amount (1 to 2 mg.). Vitamin C, like glutathione, disappears from the cataractous lens (Euler and Malmberg, 1935), while with age it decreases in the lens and increases in the aqueous (Muller and Buschke, 1934). There is less vitamin C in the aqueous humour of the aphakic eye than in the normal (Bellows, 1936).

Muller, Buschke, and Fischer (1934) are of the opinion that vitamin C provides the metabolic link between the oxidation and reduction system of the lens, and the media outside the lens. From their experiments they suggest that the following reversible reaction takes place and would constitute a cycle of respiration.

Sugar + oxidized glutathione $\longleftrightarrow$ ascorbic acid + reduced glutathione.
$C_6H_{12}O_6$ G.S.S.G. $\longleftrightarrow$ $C_6H_8O_6$ 2 G.SH.

Probably vitamin C can travel between the lens and aqueous, whereas the glutathione is retained in the lens. Szent György has shown that vitamin C will rapidly oxidize reduced glutathione, while there is some evidence that vitamin C can be derived from the reduction of sugar by glutathione. That there is some such balance between lens and aqueous humour is shown by the fact that when the lens and aqueous are incubated together the lens shows a slight gain, the aqueous a slight loss of vitamin C, whereas when incubated alone the aqueous shows a considerable loss.

AVERAGE OF TEN EXPERIMENTS
Percentage Weights of Vitamin C

Lens		Aqueous Humour		
Fresh	Exposed 5 hours to Aqueous Humour under Paraffin	Fresh	5 hours with Incubated Lens	5 hours Incubated alone
47.7 mg. %	50.5	20.8	16.1	8.3

Muller has shown that the ability of the lens to prevent oxidation of the ascorbic acid of the aqueous humour is soon lost in rabbits that have been fed with naphthalene. It is interesting to note that vitamin C is held back tenaciously by the lens, even in an animal dying of scurvy (Ray, György and Harris), although the vitamin C content of lens and aqueous in different animals bears no relation to the sensitiveness of the animal to a lack of vitamin C (Muller and Buschke, 1935).

In addition to the discovery of vitamin C, Fischer (1935) reports that minute quantities of fluorescent substances are present in the lens. The normal lens contains flavine, which he identifies with lactoflavine of vitamin B_2, and which appears to be replaced in the cataractous lens by a substance corresponding to lumiflavine, a photolytic product of flavine. The other substance is probably dimethylalloxazine. It fluoresces blue, is present in both normal and cataractous lenses, and increases in amount with age. György (1935) could find no biologically active lactoflavine in the lens, but this might be explained by the fact that lactoflavine is easily destroyed by ordinary daylight.

Conclusion

In conclusion, a review of this kind is necessarily disjointed, but I cannot help feeling that definite progress is being made towards a solution of the problem of cataract. Certainly the biochemical work of recent years has been more consecutive—there has been closer association between the different investigators, and greater attention has been paid to the clinical side of the problem.

An excess of sugar or deficiency of vitamin, a disturbance of calcium metabolism or loss of cystine from the lens, are all very likely factors in the causation of cataract, and even the effects of rare toxic substances have acquired an unexpected significance. Not only new facts, but those with which we are already familiar, are assuming a more orderly arrangement.

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S. Lomholt (*Ugeskrift for Laeger*, August 27th, 1936, p. 799), who is in charge of the skin department of the Finsen Institute in Copenhagen, gives an account of a search conducted by himself and a colleague in March, 1936, for warts and interdigital fungi (epidermophytia interdigitalis) among the school children of Copenhagen. As far as the feet were concerned, they found that warts were common in all the classes examined, the incidence of such warts being about 6 per cent. among the girls and only 3.8 per cent. among the boys. On the other hand, boys were much more subject than girls to warts on the hands, presumably because boys are more grubby than girls and scratch themselves oftener, and thus pave the way to an infection. No relation could be established between the warts on the hands and on the feet, and it was most exceptional for the same scholar to grow warts on both his hands and his feet. This is the more surprising as the infecting agent is presumably one and the same. Warts on the hands afflicted three times as many children as warts on the feet. In a class of boys from exceptionally poor homes warts on the hands were found in 23 per cent. The treatment mentioned by the author for warts on the hands includes suggestion, electrolysis, electrocauterization, electrocoagulation, radium, scraping, and patience, most warts disappearing of themselves if given time. With regard to the incidence of warts on the feet, which the author considers as a typical school infection, he notes that there has been an appreciable decline since 1934, and this may be traced to the prophylactic measures introduced in school lavatories and baths with the object of discouraging foot-to-foot infections. When the floors of such quarters are amenable to frequent washing and disinfection, without being made dangerously slippery, much can be done to prevent infection. While such measures promptly reduce the incidence of warts, interdigital fungi are much more refractory to them. Once such fungi are safely lodged in the skin of toes kept in close contact with each other by tight footwear it is very difficult to get rid of them.

INTESTINAL STRANGULATION FROM THE CLINICAL STANDPOINT

BY

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The treatment of acute intestinal strangulation is still associated with a very high mortality, and we are as yet unable to state definitely what are the causes of death in the various forms of this emergency. Early diagnosis is the first essential for successful treatment, but many of our patients do not reach the operating table until many hours or even days have elapsed. When this occurs the problem with which the surgeon is confronted is no longer a local one; widespread changes have occurred and purely operative treatment will not ensure recovery.

The importance of dehydration and alkalosis in cases of intestinal obstruction of mechanical origin is now generally recognized, and the need for pre-operative infusions of saline solution in large amount is admitted. In the case of intestinal strangulation, however, the factors causing death have not been so clearly established. Recent research work by Holt, Knight and Slome, and Aird has thrown considerable light on this subject, and their experimental findings would seem to be capable of clinical application. It appears that, as a result of the primary venous obstruction, a considerable volume of blood is held up in the affected loop of bowel, with a corresponding reduction in the total volume of circulating blood and a fall in blood pressure. In addition, toxins are formed in the bowel wall; these pass into the peritoneal cavity, are absorbed, and cause rapid collapse of the patient. It should be noted that this occurs at an early stage, and before the bowel wall has become gangrenous.

Objects of Treatment

If these experimental findings are correct, as seems likely, their clinical application is obvious. The amount of circulating blood must be brought back to its original volume by the performance of blood transfusion before operation is undertaken. Such pre-operative treatment presents no difficulties, and can do nothing but good. Control of the second factor—toxaemia—raises much more serious clinical problems. If the wall of the affected loop of bowel is laden with this depressor substance operative treatment must not only deal with the strangulation but must also prevent the toxic substance from reaching the blood stream, which it will tend to do when relief of the strangulation re-establishes the venous return from the part. In order to prevent this it has been suggested that the bowel should be resected immediately, even although it is not frankly gangrenous. Such teaching certainly appears to be founded on a rational basis, but it is a somewhat dangerous doctrine. If immediate resection with anastomosis is to be advocated and widely practised the mortality from intestinal obstruction is more likely to rise than to fall, since these patients are gravely ill and unable to stand such a procedure.

Illustrative Cases

It is possible, however, to adopt an intermediate course which will permit the removal of the strangulated bowel from the abdomen, resection, and subsequent anastomosis without subjecting the patient to a relatively prolonged operation. Stage resection of the large bowel is widely practised, and has benefited many patients; it can be employed successfully for the small intestine also. The procedure is not new, but it is probably not employed as frequently as it might be. The following case notes illustrate the possibilities of this method of treatment.

CASE I

A boy aged 13 was admitted to hospital with the history that he had been operated upon for acute appendicitis four months previously, and that during his convalescence he had developed acute rheumatic fever. Whilst still under treatment for this condition the boy was seized with very severe colicky pain in the abdomen, followed by vomiting, which was repeated on many occasions. On admission, thirty-six hours after the onset of the attack, the child was in a state of profound shock. The pulse was weak, thready, and uncountable; the respirations were 38, and the temperature was 101° F. The abdomen was distended in its lower part and tender, but not rigid.

Strangulation by a band was thought to be the cause of the intestinal obstruction. Following blood transfusion the abdomen was opened. The diagnosis was confirmed by finding a loop of ileum grossly distended and gangrenous, the result of a band. Fluid smelling of *B. coli* was present in the pelvis. The band was divided, and the affected loop rapidly brought outside the abdomen. An enterostomy was performed immediately above the gangrenous area, and the peritoneal cavity was drained. Twenty-four hours later, without anaesthesia, the exteriorized loop was removed. All the intestinal contents were collected and fed into the distal end of the divided ileum by tube and funnel. The child made a rapid recovery, and at a later stage the wound was freely opened and the continuity of the ileum re-established.

In view of the grave condition of this boy it is virtually certain that, had immediate resection and anastomosis been attempted, a successful result would not have been obtained.

The notes of the second patient treated by this method illustrate the value of the procedure, and seem to offer clinical proof of the contention that, if in experimental animals the depressor substances from the strangulated bowel are prevented from reaching the peritoneal cavity life is prolonged (Holt).

CASE II

A woman aged 23 had complained of colicky abdominal pain and vomiting, which had increased in severity during a period of four days. At first there had been associated diarrhoea, but latterly the bowels had been closed. The patient's condition was grave; the pulse was 140, the respirations 35, and the temperature 100.8° F. Abdominal examination revealed a palpable swelling situated to the right of the umbilicus. At the operation an intussusception of the terminal ileum was disclosed; the sheath was gangrenous and had perforated at one point with a resulting peritonitis. The mass of the intussusception was brought to the surface of the abdomen and an enterostomy performed. Twenty-four hours later the mass was excised without anaesthesia, and later the continuity of the bowel was re-established. This was followed by an uneventful convalescence.

In this case the final collapse of the patient was due to perforation of the sheath of the intussusception, but for several days the invaginated portion or intussusceptum had been strangulated by increasing constriction of its mesentery. Depressor toxins leaking from the wall of the intussusceptum were passing, not into the peritoneal cavity but within the sheath, and thus peritoneal absorption could not take place. This might explain why four days elapsed before severe collapse of the patient occurred. Such a state of affairs is at least partly comparable to the rubber balloon experiments of the research workers.

The third patient also offers clinical proof of recent research work.

CASE III

A man aged 60 was seized with severe abdominal pain, which was followed by profuse vomiting. This continued for three days, and the patient's medical adviser was then called in. Strangulation of a femoral hernia was diagnosed, and the man was at once sent to hospital. He was very seriously ill; the pulse was rapid and of poor quality, dehydration was extreme, and the patient had marked tetanic spasms of the arms and hands. A rapid intravenous infusion of saline solution was given, and an operation was undertaken under

local anaesthesia. The administration of saline solution was continued by slow continuous drip. A portion of gangrenous ileum was found in the sac of a femoral hernia. This was resected but no anastomosis was attempted, rubber tubes being fixed into the ends of the divided bowel. When the proximal enterostomy was draining freely it was joined to the distal tube, but it was found that the proximal ileum was unable to empty itself into the distal portion of bowel via the tube. Ordinary gravity drainage was therefore re-established, but the contents were collected and utilized as in Case I. The patient's condition rapidly improved, and he was well on the way to recovery when, on the third day, he developed an acute chest lesion, from which he died.

This case supports the experimental findings relating to strangulation of short segments of bowel within hernial sacs. The blood loss is small in amount, and toxins escaping into the closed hernial sac are but slowly absorbed. The main factor in this case was the result of the mechanical obstruction with dehydration and alkalosis causing severe tetany, which was rapidly relieved by intravenous saline.

Summary

1. The method of exteriorization of strangulated bowel in patients who are gravely ill is one which can be carried out quickly and with a minimum of shock.

2. Drainage of the bowel must be established, but excision of the affected segment may, if necessary, be left until twenty-four hours have elapsed.

3. When a patient is seriously ill immediate resection and anastomosis increase the risks of peritoneal infection and of recurrent obstruction, since the over-distended proximal bowel may be unable to pass its contents through the new stoma.

4. Operative procedures must be preceded by blood transfusion or intravenous saline infusions according to the type of intestinal obstruction to be dealt with.

THE SERUM TREATMENT OF TYPHOID FEVER

BY

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Antityphoid serum was prepared quite early in the history of modern immunology. Chantemesse (1907) and various workers experimented with sera produced by immunizing animals with typhoid bacilli. However, success did not seem to attend these various early trials. Thus for many years antityphoid serum was neglected for curative purposes, and the antigenic response which typhoid bacilli are capable of eliciting was confined almost entirely to prophylactic inoculation.

However, interest has been revived during 1934 in the possibilities of a curative antityphoid serum through the work of Felix, who has elaborated a hypothesis of a Vi antigenic factor in virulent strains of typhoid bacilli. Felix (1935), using these virulent strains of *B. typhosus*, has immunized horses with living cultures and produced a new serum. Clinical trials with this antityphoid serum, prepared in the serum department of the Lister Institute at Elstree, were carried out in Palestine and in Ireland and were recorded by Felix (1935) and McSweeney (1935). The results were definitely encouraging, for they pointed to a favourable action of the serum on both the toxaemic symptoms of the disease and the pyrexia.

Working with a number of strains of *B. typhosus* isolated from cases of typhoid fever among Chinese patients in Shanghai, we were able to confirm the observations of Felix and Pitt (1934) concerning the association of the virulence of typhoid bacilli with the inagglutinability by " O " antibody (Robertson and Yu, 1936, *a* and *b*). We then proceeded to immunize a horse with two of our Shanghai strains of high virulence and relative inagglutinability.

The technique consisted of first commencing with injections of 1 c.cm. daily of *B. typhosus* extract prepared according to the method of Felix. We gave this extract for three days and then paused for four days and recommenced, using 1 c.cm. of a suspension of living organisms given intravenously. Living organisms were administered for three successive days and then the animal was rested. Gradually increasing doses of living *B. typhosus* were administered similarly for three days, with rests of four days, for ten weeks. The horse was then bled outright, and in experiments on mice our antityphoid serum was found to confer full protection against infection with highly virulent typhoid bacilli.

In view of the great importance to be attached to the exact quantitative estimation of the two essential antibodies (" Vi " and " O "), on the presence of which the potency of a therapeutic antityphoid serum would seem to depend, and in the absence of a recognized standard for this estimation, a sample of our unconcentrated horse serum was submitted for examination to Dr. A. Felix. According to the report kindly sent us by Dr. Felix, the " Vi " and " O " titres of our serum were almost equal to those of his serum No. 1, which had been used in the clinical trials in Palestine (Felix, 1935).

In selecting cases for clinical trial we were anxious to have the cases as early as possible in the disease—as soon as a completely satisfactory diagnosis had been made. In China, however, a majority of patients tend to visit different doctors and not to come to hospital until at fairly late stages, when they are desperately ill. This greatly lowers the apparent incidence of typhoid fever and raises its mortality in hospital cases. Our object was, so far as possible, only to deal with cases which clinically exhibited all the classical symptoms of typhoid fever, proved positive by Widal test, and subsequently confirmed by a positive blood culture.

We treated in all fifty-two cases of classical typhoid fever, which satisfied the above-mentioned laboratory criteria, with our locally manufactured serum. When the serum was unconcentrated the standard dose for adult patients was 50 c.cm., administered by the intramuscular route. The dose for concentrated serum was 25 c.cm. As a routine this dose was given on three consecutive days. Since, through the courtesy of Dr. Felix, we had a small supply of his concentrated serum available, we were able to treat four further cases with serum prepared at the Lister Institute at Elstree. The standard dose of this concentrated serum was 25 c.cm. given by the intramuscular route.

We did not consider it advisable to use normal horse serum as a control, as it gave very unfavourable results in the hands of Felix (1935) and McSweeney (1935).

A short summary of the main points of interest in the individual cases comprising this small series is reproduced in the following table. When using the phrase " dramatically improved " the intention has been to convey a true impression of the clinical effects, free from any exaggeration, as judged by careful and unbiased observers.

Summary

Of fifty-two Chinese patients who received Lester Institute antityphoid serum thirty cases showed definite improvement, indicated by a drop in temperature and a decrease in toxic symptoms. Seven cases showed reduction in toxaemia but no noticeable effect on the temperature curve. The remaining fifteen cases showed no appreciable effect of the serum.

Case No.	Stage of Disease Treated	Severity of Symptoms	Complications	Diagnosis			Dosage of Serum	Result
				W.B.C.	Widal	Blood Culture		
1. F., age 21	Unknown; probably 2nd week	Severe	Amoebic dysentery	13,000	+	+	3×50 c.cm.	Temperature normal after last dose
2. M., age 20	3rd week	Very severe	Severe haemorrhage	6,250	+	+	3×50 c.cm.	No improvement; death
3. F., age 13	2nd week	Very severe	Probably a perforation	3,800	+	+	3×25 c.cm.	No improvement; death
4. F., age 29	3rd week	Very severe	Nervous symptoms	3,500	+	+ (urine)	3×50 c.cm.	Great improvement at once
5. M., age 16	3rd week	Moribund	Beri-beri	4,500	+	+	3×30 c.cm.	Not improved; fatal
6. F., age 18	2nd week	Severe	—	4,400	+	+	2×50 c.cm.	Greatly improved, immediately convalescent
7. F., age 31	2nd week	Severe	—	5,400	+	+	3×50 c.cm.	Toxaemic symptoms improved
8. M., age 18	3rd week	Very severe	Severe intestinal haemorrhage	2,600	+	+	2×50 c.cm.	No improvement; recovered
9. F., age 43	3rd week	Severe	—	4,100	+	+	1×25 c.cm. 1×30 c.cm.	Toxaemic symptoms improved
10. F., age 22	2nd week	Mild	—	5,100	+	+	2×20 c.cm. 2×30 c.cm.	Dramatically improved
11. M., age 14	3rd week	Severe	Bronchitis	2,600	+	+	3×30 c.cm.	Greatly improved after last dose
12. M., age 23	4th week	Severe	Parotitis	3,200	+	+	3×50 c.cm.	Greatly improved
13. M., age 23	3rd week	Very severe	Herpes on lips	2,000	+	+	3×50 c.cm.	No improvement; recovered
14. M., age 12	2nd week	Very severe	—	7,250	+	+	3×25 c.cm.	Great improvement; convalescent after ast dose
15. M., age 14	2nd week	Very severe	Bronchitis, multiple furuncles on neck and face	1,650	+	+	3×30 c.cm.	Great improvement
16. M., age 29	3rd week	Very severe	Bronchitis, intestinal haemorrhage	—	+	+	2×25 c.cm. Felix	No improvement; fatal
17. M., age 14	3rd week	Very severe	—	—	+	+	3×30 c.cm. Felix	Great improvement; convalescent three days after last dose
18. F., age 45	2nd week	Very severe	—	—	+	+	2×25 c.cm. Felix	Toxaemic symptoms improved
19. F., age 35	2nd week	Mild	—	—	+	+	1×25 c.cm. 1×15 c.cm. Felix	Dramatically improved; convalescent three days after last dose
20. M., age 29	4th week	Very severe	Intestinal haemorrhage	—	+	+	2×20 c.cm.	Greatly improved
21. F., age 30	2nd week	Severe	Pneumonia, pyelitis	7,000	+	+	2×50 c.cm.	Toxaemic symptoms improved; no effect on temperature
22. F., age 17	3rd week	Very severe	Pneumonia, beri-beri	8,150	+	+	2×50 c.cm.	Greatly improved
23. F., age 25	2nd week	Very severe	Bronchopneumonia	—	+	+	2×25 c.cm.	No improvement
24. F., age 16	2nd week	Severe	—	—	+	+	2×25 c.cm.	Greatly improved
25. F., age 29	2nd week	Severe	Pyelitis	1,400	+	+	3×50 c.cm.	Dramatically improved
26. F., age 31	2nd week	Severe	—	4,400	+	+	1×25 c.cm. 2×50 c.cm.	Dramatically improved
27. F., age 29	2nd week	Severe	—	7,500	+	+	3×50 c.cm.	Greatly improved
28. M., age 19	1st week	Mild	—	3,800	+	+	3×50 c.cm.	Dramatically improved
29. F., age 33	3rd week	Severe	—	2,550	+	+	3×50 c.cm.	No improvement
30. M., age 34	3rd week	Severe	Diarrhoea	5,050	+	+	3×50 c.cm.	Discharged against advice
31. M., age 34	3rd week	Very severe	Pneumonia, intestinal haemorrhage	4,250	+	+	3×50 c.cm.	General condition improved, temperature remained; died suddenly
32. M., age 21	2nd week	Severe	Decubital ulcer	5,700	+	+	4×50 c.cm.	No improvement
33. F., age 32	3rd week	Severe	—	6,150	+	+	3×50 c.cm.	Toxaemic symptoms improved; little effect on temperature
34. M., age 16	3rd week	Extremely severe	Advanced tuberculosis	1,250	+	+	3×50 c.cm.	No improvement
35. M., age 18	2nd week	Severe	—	4,200	+	+	3×50 c.cm.	Dramatically improved
36. M., age 26	3rd week	Severe	—	6,200	+	+	3×50 c.cm.	Dramatically improved
37. M., age 24	2nd week	Severe	—	4,500	+	+	3×50 c.cm.	Dramatically improved
38. M., age 50	2nd week	Very severe	—	7,150	+	+	3×50 c.cm.	No improvement
39. F., age 17	2nd week	Very severe	Bilateral bronchopneumonia	5,200	+	+	3×50 c.cm.	No improvement
40. F., age 36	2nd week	Severe	—	5,900	+	+	1×25 c.cm. 2×50 c.cm.	Dramatically improved
41. M., age 22	1st week	Moderately severe	—	6,550	+	+	2×50 c.cm.	Dramatically improved
42. M., age 43	2nd week	Severe	—	5,300	+	+	2×50 c.cm.	Dramatically improved
43. M., age 20	3rd week	Very severe	—	—	+	+	2×45 c.cm.	Toxaemic symptoms improved; little effect on temperature
44. F., age 7	2nd week	Severe	—	5,200	+	+	2×20 c.cm.	Convalescent four days after second dose
45. F., age 20	1st week	Severe	Acute bronchitis	6,200	+	+	3×50 c.cm.	Toxaemic symptoms improved; little effect on temperature
46. F., age 23	2nd week	Extremely severe	Pneumonia	2,100	+	+	3×50 c.cm.	No improvement
47. F., age 13	3rd week	Very severe	Bronchitis and tympanitis	3,950	+	+	3×50 c.cm.	Dramatically improved
48. F., age 8	2nd week	Extremely severe	Intestinal haemorrhage	2,600	+	+	3×25 c.cm.	No improvement
49. M., age 16	2nd week	Severe	—	—	+	+	3×45 c.cm.	Greatly improved
50. M., age 21	2nd week	Severe	Pleural effusion	3,350	+	+	3×45 c.cm.	Greatly improved
51. M., age 15	2nd week	Severe	—	6,450	+	+	3×25 c.cm.	Convalescent after last dose
52. M., age 29	5th week	Extremely severe	Severe intestinal haemorrhage	6,250	+	+	3×50 c.cm.	No improvement; died
53. M., age 19	2nd week	Severe	—	1,700	+	+	3×50 c.cm.	Greatly improved
54. F., age 17	1st week	Severe	—	4,850	+	+	1×25 c.cm. 1×50 c.cm.	Convalescent after second dose
55. M., age 4	4th week	Very severe	Pneumonia, otitis, and abscesses	—	+	+	2×25 c.cm.	Convalescent four days after second dose
56. M., age 18	2nd week	Severe	—	4,600	+	+	2×50 c.cm.	Discharged against advice

Of the four cases treated with Felix's Lister Institute serum two showed dramatic improvement. One further case showed lessening of toxaemia. The remaining case showed no change.

It is our impression that the new antityphoid serum is definitely beneficial when given to the typhoid patient during the first or second week of illness in decreasing the toxaemia and shortening the febrile course.

Acknowledgements

We desire to record our indebtedness to Drs. J. Edgar and R. H. Robertson of the Keylock and Pratt Infirmary for help in the preparation of serum, and to Drs. W. R. Johnston, A. J. Watson, S. N. Cheer, A. E. Towers, M. H. Huang, H. W. Tseng, R. Wong, W. S. Fu, H. T. Chen, and C. L. Kao of the various hospitals in Shanghai, Nanking, Wuchang, and Yunnanfu, who have been in charge of the patients treated.

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DYSPHAGIA WITH ANAEMIA IN A MALE

BY

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SURGEON IN CHARGE, EAR, NOSE, AND THROAT DEPARTMENT, BRISTOL ROYAL INFIRMARY

The association of dysphagia with anaemia was noted over sixty years ago: more recently a third symptom, stomatitis and glossitis, has been added to complete the syndrome usually known as the "Plummer-Vinson syndrome"—no doubt because we owe our first description of the characteristic changes in the oesophagus to A. Brown Kelly and Dr. R. Paterson.[1] The condition is not of great rarity: I have observed twenty-odd cases in a series of just over 500 patients submitted to oesophagoscopy. But most observers agree in describing it as a disorder confined to women; the finding, therefore, of an apparently typical case in a male subject has the interest attaching to the unusual.

Case Report

A man aged 71 came to the out-patient department on August 6th, 1936, complaining of difficulty in swallowing during two months, with no appreciable loss of weight. I was not there then, but it is recorded that the hypopharynx was full of mucus, and there was no evidence of obstruction to a bolus viewed by *x* rays: a lozenge was prescribed. Six weeks later I first saw him; the symptoms were unchanged, but I noticed that he was very pale, with conjunctival pallor; he had never known he was anaemic. He had also glossitis, with loss of papillae except in the centre of the tongue; the insides of the cheeks were sore, and he had a linear scar from each angle of the mouth, and when questioned said that the corners of his mouth had been sore for several years. The blood showed: red blood cells, 5,000,000; haemoglobin, 60 per cent.; Dr. A. D. Fraser reports "anisocytosis fairly well marked, poikilocytosis moderate, polychromasia moderate, microcytosis fairly well marked, megalocytes and nucleated reds absent; erythrocytes show lack of haemoglobin; hypochromic anaemia." Van den Bergh negative, direct and indirect. Test meal: no free HCl in resting juice; one hour after meal combined HCl in 1 c.cm. neutralized by 0.2 c.cm. decinormal soda. Oesophagoscopy: at upper end of oesophagus a thin white demilune web round the posterior aspect reduces the lumen to 8 mm. across. It yielded readily to slight pressure from the endoscope, with just a trace of bleeding. Below this the oesophagus was normal except for pallor of the mucosa; cardia at 37 cm. from teeth, normal. Immediately following the instrumentation swallowing has become normal. The patient has been sent home, taking 30 grains of iron and ammonium citrate thrice daily; no dysphagia, the soreness of mouth is less, pallor not materially changed.

Pathology

The aetiology is in dispute. Paterson and Brown Kelly[2] regard the dysphagia as primary, with anaemia due to interference with nutrition; thus following the older descriptions of anaemia occurring in "hysterical dysphagia."

"At a meeting [of the Laryngological Section of the Royal Society of Medicine] in 1919 Brown Kelly and I drew attention to a clinical syndrome in women, the essential feature of which is a gradually increasing inability to swallow, due to spasm of the pharyngo-oesophageal sphincter; often associated with changes in the buccal and pharyngeal mucosa and *at a later stage* with anaemia, which is to be regarded as a *secondary manifestation* of the dysphagia. Plummer, approaching it from the physician's point of view, called it hysterical dysphagia, and later Vinson laid stress on the anaemia and splenomegaly.[5] The blood changes are those of chlorosis and secondary anaemia with considerable reduction in the haemoglobin (Munro Cameron)."[6]

The patients are women and come under observation in middle life with a long history of gradually increasing dysphagia, which eventually confines them to a fluid diet. Mild glossitis with atrophy may be early; later, the tongue is smooth and the buccal mucosa dry and pale.

On the other hand, it has been suggested that the changes in the mouth and pharynx are secondary to the anaemia. Dr. R. S. Johnson[3,7] reports six cases in St. Bartholomew's Hospital. All were women: the anaemia was severe, of secondary type; haemoglobin 32 to 50 per cent.; colour index about 0.5; complexion striking, brownish-yellow, suggesting pernicious anaemia; glossitis and cracks at the angles of the mouth were noted in four; dysphagia in five; complete achlorhydria in all; slight enlargement of spleen in one only; fragility of red corpuscles increased. He considers the changes in the mucosa secondary to the anaemia. With this view I agree. A feature not included in the above accounts is the formation of a thin web at the oesophageal entrance, instead of the spasm mentioned above: in my own experience this is the more usual finding.

Treatment

The essential is the administration of iron in large doses—inorganic preparations are to be preferred; the daily dose of iron and ammonium citrate is 60 to 120 grains for eight weeks or more. It may be necessary to repeat treatment during several years. Where spasm or webbing is present treatment should begin with dilatation of the oesophagus; this rarely needs to be repeated. The prognosis is good, although it is said that later malignant changes in the oesophagus are relatively frequent in these patients.

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[4] Ibid. (Sect. Therapeutics), 1930–1, xxiv, 543.
[5] *Minnesota Med.*, 1922, v, 107.
[6] *Quart. Journ. Med.*, 1928, xxii, 43.
[7] Ibid., 1932, N.S., i, 41.

The issue of the *Bulletin de l'Office International d'Hygiène Publique* for October includes articles on cholera in India, the duration of immunity conferred by vaccination in relation to the type of vaccinial reaction, vaccination in Mexico, poliomyelitis in Spain, lymphogranulomatosis in the French Colonies and in Sweden, and the supervision of milk in Turkey.

Clinical Memoranda

Mixed Tumour of the Palate

The so-called "mixed salivary gland tumours" of the palate are of extreme rarity,[1] and Dr. Gourlay's interesting memorandum[2] encourages me to record another case.

CASE RECORD

The patient was a lady of 60 in good general condition. The following details were elicited. In 1909 pain in the roof of the mouth drew attention to a swelling in the *soft* palate. In 1914 the "cyst" was removed by operation, and the pain disappeared. In 1925 the pain, dull and continuous in character, returned, but was endured till 1931, when she was admitted to the Royal Infirmary, Aberdeen. The clinical records of that year state that in the mid-line of the *hard* palate was a purplish swelling, "cystic," and not tender on palpation. The uvula was not present, having been removed at the operation in 1914. The lymph nodes of the neck were not palpable. A second operation was performed, and the swelling separated from the hard palate by a periosteal elevator and removed. The pain disappeared for a year after this operation. In May, 1934, two small swellings were seen on the right and left of the mid-line of the soft palate, and in addition it was noted that the pillars of the fauces were infiltrated on the right side. Further surgical measures were not undertaken.

In March, 1935, when I first saw the patient, there were two rounded swellings, one on each side of the mid-line of the anterior part of the soft palate; and on the hard palate internal to the alveolar sockets of the right upper bicuspids was another swelling. Each of these three swellings was about one centimetre in diameter. An infiltration of the right faucial pillar with a chain of yellowish bead-like nodules was both visible and palpable. A section was taken from the swelling of the hard palate, and sent for histological examination and for comparison with the tumour removed in 1931.

Histological Findings.—"The tumour consists of pseudo-acini, fairly round and regular in some places, in others very elongated and irregular. The cells forming these acini are oval cells with a small nucleus and pale cytoplasm. Some of the cells have tailed processes, which are fused in the centre into homogeneous masses. Sometimes the layers of cells are single, but most often several layers form each acinus and fuse with the cells of a neighbouring acinus. There are one or two trabeculae of fibrous tissue in the growth, but on the whole little matrix and many cells. The tumour is considered to be a 'mixed salivary gland tumour,' although endothelliomatous characteristics are present. The histological appearances are the same as those of the 1931 specimen, and do not suggest that the second tumour is more malignant than the first."

In view of the fact that the tumour was extremely cellular and without much myxomatous degeneration or pseudo-cartilage formation, it was considered that it might yield to radium treatment. The palate and fauces were accordingly irradiated by the interstitial method. In eight weeks the palatal and faucial swellings had disappeared, and complete relief was afforded for eighteen months.

There is now a very small, circular, punched-out ulcer in the soft palate. This is only of a few weeks' duration, and is the result of late radio-necrosis of the scar of the first operation. More important is the reappearance of infiltration at the root of the right anterior pillar of the fauces.

COMMENTS

The following points are of significance in that they support the observations of several writers. (*a*) The relatively good prognosis associated with the lapse of several years before the original tumour reached dimensions calling for surgical intervention.[3] (*b*) The liability to local recurrence even when the tumour shows histologically a considerable degree of differentiation.[3] (*c*) The absence of change in the histology of successive local recurrences after an interval of years.[3] (*d*) The infiltrative character of the recurrence at a late stage of the clinical history.[3] (*e*) the response to radiation treatment in the light of the histological findings.[4]

The origin of these mixed tumours of the palate is a subject of controversy. There seems little to support the view that they arise from embryonic salivary gland "rests" or from sequestrated fragments of salivary gland tissue. The view that palatal tumours as well as mixed tumours of the salivary glands proper are members of a group of epithelial tumours with a characteristic tendency to undergo varying degrees of dedifferentiation has histological evidence in its favour. It seems reasonable to suggest, therefore, that palatal tumours should cease to be called mixed *salivary gland* tumours of the palate, and be referred to only as mixed tumours of the palate.

I wish to thank Mr. William Anderson and Mr. Gordon Bruce for their permission to record this case.

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Rapidly Fatal Spontaneous Pneumothorax

I am indebted to Dr. P. B. Skeels, H.M. Coroner for the metropolitan district of Essex, for permission to report the following case, which, in view of the recent article in the *British Medical Journal* by Dr. R. A. Young[1] on spontaneous pneumothorax, may prove of interest.

A boy, aged 15, was brought to the Connaught Hospital in a moribund condition with the following history. He had been riding on his father's lorry when he suddenly complained of difficulty in breathing, accompanied by acute pain in the upper abdomen. He rapidly became unconscious and cyanosed. On admission he was unconscious, very cyanosed, cold, and collapsed. His respirations were laboured. The pulse was very slow and irregular, and of poor volume. Twitching of the hands and arms was present, accompanied by nystagmus. Despite cardiac stimulants and oxygen he died within a few minutes. A necropsy was performed by Dr. Keith Simpson, to whom I am indebted for the following details.

When the body was seen stripped the chest appeared asymmetrical, the right side being more prominent than the left. On opening the thorax the right pleural sac was found to be distended by air under considerable pressure. The right lung was completely collapsed and the heart displaced to the left side. Examination of the right lung revealed a ruptured emphysematous bulla, which had opened into the pleural space. Both lungs showed evidence of emphysema from pressure on the bronchi by greatly enlarged root glands. The abdominal and cervical lymphatic glands were also enlarged from tuberculous infection. The other organs were quite healthy. Death was thus due to shock and cardiac failure from the displacement of the heart due to the spontaneous valvular pneumothorax.

The case is of interest, first, because the pain was referred to the abdomen and not to the thorax, and, secondly, because of the extreme rapidity with which death ensued. Burrell[2] mentions a case in which the symptoms were such as to suggest a diagnosis of perforated gastric ulcer. Beardsley[3] reports a case in which the onset was marked by acute abdominal pain which persisted until death two days later, and as evidence of the rarity of abdominal symptoms in this condition, he quotes a paper by Stanton,[4] who collected details of sixty-one cases, none of whom exhibited abdominal pain. A further case in which the onset was marked by abdominal symptoms is mentioned by Shrikhande,[5] nausea, vomiting, and abdominal pain being complained of.

Oechsli and Skillen[6] describe a case of spontaneous pneumothorax of a chronic type which started with sudden abdominal pain that persisted. The diagnosis of pneumothorax was not made until five days later.

In all the above cases the development of the condition was slow. Death did not occur in under two days despite the fact that apparently no active treatment by air removal was instituted during the first twenty-four hours. The case reported above would therefore seem to have been unusually rapid in development, as the patient died within twenty minutes of the onset.

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Acute Fulminating Agranulocytic Angina

The following case seems worthy of record, as it shows how extremely severe agranulocytosis can be.

I was called to see a sprightly lady of 77 years on June 25th, 1936. The history was that she had just come back from a cruise to the Dardanelles, and the day before, the 24th, complained of feeling unwell but not sufficiently ill to seek medical advice. When I saw her she complained bitterly of the pain in her throat and of feeling very weak. Her temperature was 104° F., her pulse 120, and she had a dry, very red, inflamed throat with no membrane or ulcers. I thought that she had a very severe but ordinary streptococcal throat, and aspirin and a gargle were prescribed.

The following day the temperature had dropped to 102°, but there was no other alleviation of her condition. Indeed, the throat was more painful. The tonsillar glands and those deep to the upper part of the sterno-mastoid were swollen and exquisitely tender. It was almost impossible for her to swallow, and the tongue was beginning to be covered with a dry brown fur. On June 27th the temperature had fallen to 100°, but the patient's condition had become much worse. The glands were more swollen, there was a small patch of membrane on the right tonsil, and the patient had an ashen-grey colour. She was being sick, vomiting brown watery fluid, which seemed to contain pus.

On account of the complete absence of any response to treatment a white blood count was taken by Dr. Janes. It revealed: leucocytes, 490 per c.mm.; differential count: polymorphs, 2 per cent., lymphocytes 54 per cent., monocytes 44 per cent., eosinophils *nil*. One normoblast was seen. Dr. Janes stated: "In the stained film the red cells are normal in shape, size, and staining reactions." On examination of the swab from the tonsillar region stained by Gram's method, no organisms of Vincent's angina were seen. On serum culture no Klebs-Loeffler bacilli were found, and on blood-agar culture *Streptococcus viridans*, pneumococci, and *M. catarrhalis*, and a few haemolytic streptococci were seen. Following on this report, and on consultation with Dr. Donald Hall, 20 c.cm. of pentnucleotide was given on June 27th. This was followed by a rise of temperature to 102°. However, at 5 o'clock the following morning the patient suddenly died.

Assuming that the patient's illness started when she felt unwell—that is, the day before I saw her—it will be seen that it lasted four days and a few hours. Inquiry into her habits revealed that she never took any drugs of any kind except aspirin, and that she had not seen a doctor for years, except to be vaccinated before she went on her travels. She herself confirmed the fact that she only took aspirin. There was a history of a very severe attack of tonsillitis many years ago. Thus this is a case of agranulocytosis of striking severity in which there was no traceable cause.

Hove. JOHN CUMMING, M.B., Ch.B.

Reviews

METABOLIC DISEASES

The increasing interest taken in diseases of metabolism has been shown by the appearance of an American translation of Professor GRÄFE's textbook on *Metabolic Diseases and their Treatment*.[1] The late Sir Archibald Garrod, himself an authority on the subject, used to speak of "the metabolic face," by which he meant the blank look of indifference with which in years gone by he considered his references to metabolic diseases were met. A glance at the index of almost any textbook published thirty or forty years ago shows the then prevailing tendency to put various diseases of unknown causation into this scrap-heap. Times have changed in that respect with the rise of biochemistry; the centre of interest shifted from the study of end-products to examination of the blood—the internal medium of exchange—and now elaborate methods are being devised for studying the changes in the tissue cell itself. For full information and reasonable discussion of diseases of metabolism we can, with but few reservations, recommend this book. After a general discussion of foodstuffs as energy producers, there are useful sections on undernutrition and on obesity. Then comes a very full account of diabetes mellitus, gout, and diabetes insipidus, with shorter descriptions of certain other metabolic disturbances. Attention is drawn to the curious fact that primary diseases of protein metabolism are very rare apart from associated cyclical amino-acids (as in alkaptonuria), aliphatic sulphur-containing acids (as in cystinuria), and nucleins (as in gout). And of these the first two appear to be inborn errors of metabolism, as Garrod phrased it, probably due to the absence of a special intracellular ferment, a congenital defect inherited along Mendelian lines.

In the section on diabetes proper emphasis is laid on the importance of assessing the amount of carbohydrate assimilable from a vegetable food rather than simply estimating its carbohydrate content. It is evident that in the past carbohydrate intake was even more restricted than was intended through lack of this consideration. There is an interesting calculation, taken from Joslin, of the percentage of deaths in the first year after the onset of diabetes under different methods of treatment. In the Naunyn Era (low carbohydrate diet with unrestricted fat) it was 18.1 per cent.; in the Allen Era (alimentary rest) 8.7 per cent.; in the early Banting Era (insulin and low carbohydrate diet) 5.8 per cent.; in the later Banting Era (insulin with higher carbohydrate rations and less fat) 4 per cent. As time goes on we shall know more of the ultimate prognosis in diabetes, but a reduction of immediate mortality since 1914 to less than one-quarter of its former level, despite the apparent increase in the number of cases, is no mean achievement.

From a book comprising 550 pages it is perhaps unreasonable to ask for more; but we feel that space could have been saved in the sections on obesity and diabetes in which to discuss the general effects of hormones on metabolism. Then, although there is a helpful section on the calcareous diatheses, we feel that in view of present trends a discussion on mineral metabolism in general and on acid-base equilibrium is called for. We are rather surprised at the author's commendation of rectal feeding with proteins and fats, for it is more than twenty-five years since it was shown that the nitrogenous metabolism of patients thus fed closely approximated to that of fasting individuals, since when only dextrose in normal saline

[1] *Metabolic Diseases and their Treatment*. By Dr. Erich Gräfe. Translated by M. G. Boise under the supervision of E. F. du Bois, M.D., and H. B. Richardson, M.D. London: H. Kimpton. (Pp. 551; 37 figures. 32s. net.)

has usually been given. And Gee's dictum still holds, "A little food in the stomach is worth a lot in the rectum." There is an evident discrepancy between the statement on page 34 that ergosterol is vitamin A and that on page 47 that "ergosterin . . . after irradiation and vitamin D are identical." On page 476 it is stated that "the great advantage of atophan over colchicin is that it is not poisonous," and yet on the next page we read "large doses taken over a long period have been known to cause severe liver and kidney injuries, in fact acute yellow atrophy has been ascribed to its use." And not only after large doses. The clue is provided by Dr. George Graham's observation that if the uric acid content of the blood is high and the drug is only given on two consecutive days in each week, ill results do not follow, but certainly may do otherwise. That this opinion is widely held is shown by the fact that atophan is now scheduled under the Poisons and Pharmacy Act. But these are blemishes which can easily be removed in the next edition.

NUTRITIONAL FACTORS IN DISEASE

The book with this title, by Dr. W. R. FEARON, is one that needed to be written.[2] It could hardly have been better written, for it gives a well-ordered, comprehensive, accurate, up-to-date, and concise account of the subject with which it deals. It is, in fact, precisely what the student and practitioner need to know of a subject which day by day becomes increasingly important both for preventive and for curative medicine. The author does well to emphasize this importance at the very outset by an apt quotation from Louis Lemery (1704):

"If Foods contribute so necessarily to the preservation of Life and Health, they also produce the greatest part of those Distempers, to which we are subject . . . and so the Knowledge we ought to be the most desirous of should be that of Foods."

For the acquisition of this knowledge, in so far as it relates to distempers caused by deficiency, excess, or unbalance of essential nutrients in the diet, Dr. Fearon's book provides the means. Each food factor—be it carbohydrate, protein, lipide, inorganic constituent, or vitamin—is considered in turn, and the coactions that exist between them are emphasized.

"Two primary factors act to alter the composition of man's internal *milieu*: the intrinsic activity of the tissues and organs, making for depletion and contamination; and the nutritional activity of the organism, making for enrichment. Health requires that these two activities be balanced within exact limits."

It is shown how these activities are balanced, how the balance may be disturbed by faults in composition of the food, and how distempers may arise in consequence. It needs but to peruse the book to learn that these distempers, if not the greatest part of those to which we are subject, form a very considerable part of them—a part which the acquisition of new knowledge is rapidly increasing.

It would be strange if in a book of this kind there were no mistakes. One—obviously a misprint—occurs on page 94, where the last two words of the second paragraph should be "hypochromic anaemia," not "hyperchromic anaemia." Another occurs on page 116, where the statement is made that beri-beri "is only found where the diet is almost entirely composed of rice that has been 'polished' to ensure better keeping." This statement would be true were the word "usually" or "often" substituted for the word "only."

This work is well worthy of the award of the Buckston Browne prize for 1935 made to its author by the Harveian Society of London.

[2] *Nutritional Factors in Disease.* By W. R. Fearon, M.B., Sc.D. London: William Heinemann Ltd. 1936. (Pp. 141. 7s. 6d. net.)

MATERNITY AND POST-OPERATIVE EXERCISES

Although Charles White of Manchester over a century ago allowed his patients to get out of bed on the third day of the puerperium, it is only within recent years that obstetricians have ceased to truss up their patients and keep them flat on their backs for an interminable period. Miss MARGARET MORRIS, in conjunction with Miss M. RANDELL, has published a small book entitled *Maternity and Post-operative Exercises,*[3] in which she advocates special exercises and movements, set to music, for use during pregnancy, labour, and the puerperium. The exercises during pregnancy have for their aim the mobilizing, stretching, and loosening of the joints, particularly of the pelvis, improving the circulation, aiding peristalsis, and teaching conscious control of tension and relaxation of the muscles. The "labour exercises" are devised to teach relaxation, to control the tilt of the pelvis, and to accustom the woman to the abnormal position she will be called upon to occupy. Those for the puerperium are concerned, among other things, with restoring the figure to the normal.

With the underlying principles most modern obstetricians will be in complete agreement, but it is open to doubt whether such exercises will indeed influence the course of labour. The figure may be restored by very simple exercises, and it is a matter of opinion whether a more elaborate system is necessary. When the whole population is taught such exercises their application to midwifery will be simple and advisable, but the difficulties and expense involved in teaching the technique will probably prevent their adoption in the immediate future. We would like to see the Morris system given a fair trial.

DR. HEISER'S ODYSSEY

A Doctor's Odyssey,[4] by Dr. VICTOR HEISER, late of the Rockefeller Foundation, is an epic of preventive medicine. The book opens dramatically with the bursting of a dam which caused three thousand deaths in less than ten minutes in Johnstown, Pennsylvania. The author, a boy of 16, saw his home disappear, crushed like an eggshell by the wall of water. Orphaned and temporarily penniless, young Heiser worked for a time as a plumber's assistant and as a carpenter until the salvage of part of his patrimony allowed him to join the medical school of Philadelphia. Feeling drawn towards preventive medicine, he entered the Marine Hospital Service, where his remarkable administrative ability found wide scope in immigration work at Boston and later at Naples. Soon after the conclusion of the Spanish-American War he was appointed the first Chief Quarantine Officer of the Philippines.

Health conditions in the islands at that time were in a parlous state. Plague and cholera were rampant, forty thousand unvaccinated natives died annually of smallpox, fifty thousand of tuberculosis. Beri-beri claimed countless victims, while more than ten thousand lepers wandered at large. The infant mortality was one in two. In parts of Manila houses were so closely packed that there was no space for streets or alleys, and the wretched people had to creep through human excrement beneath other buildings to reach their homes.

The chapters describing the measures taken by Dr. Heiser and his colleagues, which resulted in the transformation of the Philippines into a comparative health resort, are of deep interest. Apart from physical and administrative difficulties it was necessary to overcome

[3] *Maternity and Post-operative Exercises: In Diagrams and Words.* By Margaret Morris, in collaboration with M. Randell. London: William Heinemann Ltd. 1936. (Pp. 141. 7s. 6d. net.)

[4] *A Doctor's Odyssey. Adventures in Forty-five Countries.* By Victor Heiser, M.D. London: J. Cape Ltd. 1936. (Pp. 547. 15s. net.)

the indolence and superstition of the natives, and the opposition of conflicting political and commercial interests. Nor were unlimited funds available. The only money forthcoming from the United States was a contribution of a million dollars for indemnification of the owners of cattle destroyed in an outbreak of rinderpest.

His task in Manila brilliantly accomplished, Dr. Heiser left the Philippines in 1914 to join the Rockefeller Foundation, under whose auspices he made sixteen trips round the world, visiting more than sixty countries. In the early days the assistance of the Foundation, despite its wealth of scientific and financial resources, was seldom welcomed, and it required all Dr. Heiser's diplomacy to overcome the objections of local medical authorities.

In the course of these wanderings he had ample opportunities of comparing the methods and the mentality of the colonial administrations of different countries. His impressions of the British are on the whole favourable. Shortly after the war, while still with the Rockefeller Foundation, he returned for a time to the Philippines, to find that a change in the administration had almost destroyed the fruits of his labours in preventive medicine. With characteristic tenacity and determination he rebuilt the shattered edifice, helped by the whole-hearted support of the Governor, General Wood, himself a medical man.

This book contains vivid descriptions of tropical diseases, of places, and of people. The author is an acute observer with a dry sense of humour. The style is worthy of the material. Dr. Heiser writes with admirable modesty, but nevertheless reveals himself as a man of high physical and moral courage, a lovable character, whose chief aim in life has been the betterment of his fellow men.

DISEASES OF THE NOSE

Professor TERRACOL, with the collaboration of a number of colleagues, has produced a most attractive and readable book upon the rather hackneyed subject of *Diseases of the Nose*.[5] By writing accounts in the various divisions far more detailed than is usual they have provided much of interest that is lacking in most textbooks. The physiology and general pathology and vasomotor disturbances in the widest sense are contained in the first section, and in the second are included the local conditions due to injury and disease. Within the limits which have been set the work is excellent; but the exclusion of regions so intimately connected as the accessory sinuses, and the description of disease in terms of regional anatomy rather than pathological distribution, produce in some places a false set of values. There is thus, as an instance of the first, a good account of tumours of the nose, but it is not stated in what precise situations these tumours arise, and much that has been written refers to tumours in the lateral mass of the ethmoid; this fact it has been convenient or even necessary to ignore. As an instance of the second there is an excellent and detailed account of rhinoscleroma as it affects the nose, but this ends with little more than a casual mention that rhinoscleroma also affects and causes stenosis in the lower air passages.

The book is therefore not likely to be of much interest to the general medical reader, but the specialist will find it full of information and pleasant reading. The illustrations are good on the whole, but the attempts to reproduce microscopical appearances by photomicrography are as usual a failure, lacking both the definition and colour of the stains which are essential to give a real representation of the original.

[5] *Les Maladies des Fosses Nasales.* By J. Terracol. Paris: Masson et Cie. 1936. (Pp. 554; 223 figures. Broché, 110 fr.; cartonné toile, 130 fr.)

Notes on Books

The Management of the Newborn Baby is a useful and practical booklet by Dr. ALAN MONCRIEFF. Though it is written primarily as a guide for midwives, the newly qualified practitioner might well carry it in his pocket during his earlier confinements, for detailed information is given on many small but important points which are not stressed in the curriculum. Dr. Moncrieff deals fully with questions of general hygiene and the problems of lactation and artificial feeding. Sections are also devoted to congenital malformations and the care of the premature infant. The booklet is published by the Association of Maternity and Child Welfare Centres, Carnegie House, 11, Piccadilly, London, W.1; the price is 9d.

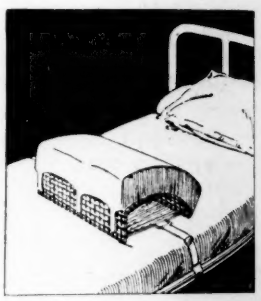
Professor C. OPPENHEIMER has now produced the fourth and fifth parts of the supplement to his great monograph *Ferments and their Action*.[6] These parts complete the revision of the carbohydrases, aminases, and proteases. Research upon enzymes is at present being prosecuted with great activity, and this publication provides, in a very condensed form, an account of all the important work that has appeared during the last decade. It is naturally impossible to give any general account of a work of this character, and we can only pay a tribute to the great service the editor is performing in providing biochemists with an authoritative and comprehensive review of a subject of outstanding importance.

[6] *Die Fermente und ihre Wirkungen. Supplement. Lieferung* 5. By Professor Carl Oppenheimer. The Hague: Dr. W. Junk. 1936. (£1 8s.)

Preparations and Appliances

A BED SUPPORT

The "Stayput" bed support is designed to give a firm, soft, and comfortable support to any patient who has to be nursed in the Fowler position. It consists of a shaped wire frame, eighteen inches long, to which is attached a specially made dunlopillo cushion. Detachable and washable covers are supplied with it, and the support can be attached to the sides of any bed by two strong clips. It can be placed in position very easily, and will support the whole weight of the lower limbs for any length of time while allowing sufficient movement to prevent cramp. It may also be employed as a pillow, foot rest, or arm rest, and is said to be especially useful in nursing heart cases and after confinements. It is made by the Stayput Bedsupport Co., 47, High Street, Camden Town, N.W.1, and the price is 28s. 6d.

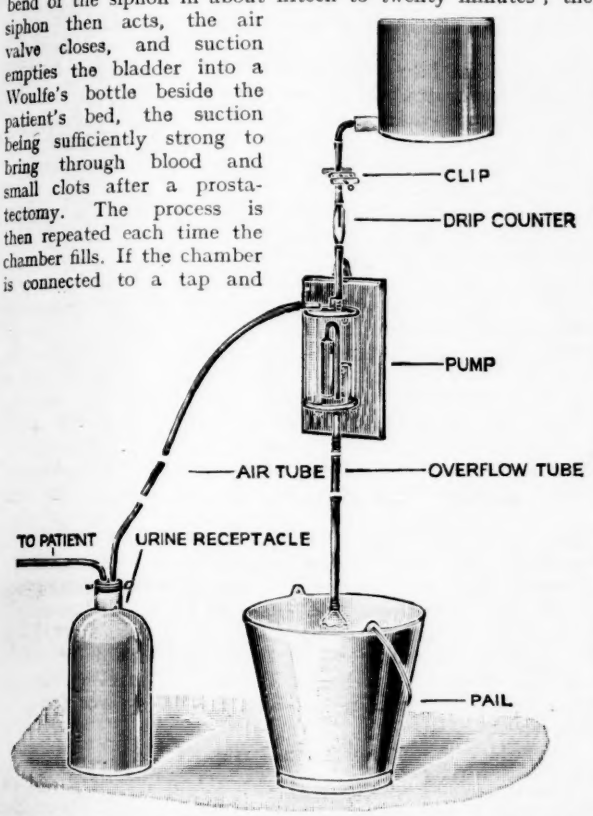


SUPRAPUBIC DRAINAGE

Mr. A. R. JORDAN, M.D., F.R.C.S., senior surgeon, Dover Hospital, writes:

Everyone must agree that the Hamilton Irving box and similar devices are not effective with a restless patient; and although various forms of apparatus, some of them portable, have been designed to keep the bladder empty by continuous suction and have been on the market for years, the fact that they are so little used seems to indicate the existence of some practical difficulties. Moreover, it is not desirable to keep the bladder empty all the time. The advantages of keeping the patient dry are perhaps more appreciated by him and the nurses than by the surgeon, but it is really a reproach to modern technique that these patients should lie in wet beds between frequent nursing attentions. Actually my impression is that the wounds heal better in prostatectomy cases when kept dry, and the general benefit in malignant bedridden cases is obvious. Some years ago I invented a pump upon what is, I believe, a new principle to produce intermittent suction, and it has worked so well that it has been used since in almost every case of suprapubic drainage in the

Dover Hospital. The original form of the pump required so much water that it had to be attached to a water-tap and drain, but it was obviously desirable to achieve a portable form, which could be used anywhere without a water supply. This required a small siphon, and considerable difficulties were experienced in getting it reliable, but these have been overcome with the help of Mr. Schranz of the Genito-Urinary Manufacturing Company, who make the pump I am about to describe, which can be used in either "mains" or "portable" form. In my apparatus there is no continuous suction, but the pump gently and silently empties the bladder three or four times an hour. The pump consists of a small glass chamber containing a siphon and closed save for the outlet of the siphon, a water inlet, and a small air valve. Water is admitted by a drip feed regulated to reach the bend of the siphon in about fifteen to twenty minutes; the siphon then acts, the air valve closes, and suction empties the bladder into a Woulfe's bottle beside the patient's bed, the suction being sufficiently strong to bring through blood and small clots after a prostatectomy. The process is then repeated each time the chamber fills. If the chamber is connected to a tap and the outlet to a waste-pipe the apparatus requires no attention, and this is the way we generally use it in hospital, having suitable fittings beside two beds. If it is required in a nursing home or private house the pump is fed from a douche-can or other suitable container, the outflow being received in a jug, and if these are reasonably large it only requires attention to put the water back from jug to container every eight to twelve hours.



It will be noted the amount of urine secreted can be readily measured, since it all collects in the Woulfe's bottle. There are other purposes to which this pump could be applied.

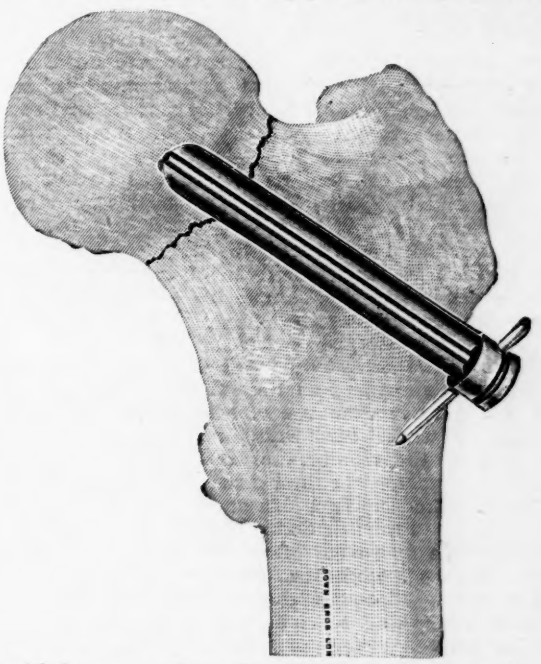
MODIFIED SMITH-PETERSEN NAIL

Mr. B. H. PIDCOCK (Winchester) writes:

In a series of seven cases of extra-articular osteosynthesis by Johannsen's method in fractures of the femoral neck I have to record two failures due to partial extrusion of the nail, resulting in a recurrence of the displacement. In both cases the operation was otherwise successful and the position of the nail quite satisfactory. In one of these cases reinsertion was unsuccessful owing to the nail again slipping out. A second reinsertion combined with a short plaster spica has resulted in bony union after eighteen months, although it is interesting to note that recent *x*-rays show that the nail has not remained in its correct position. Analysis of Johannsen's published results,[1] in which one or more subsequent operations were required in thirteen out of fifty cases, indicates that partial extrusion of the nail was probably responsible in at least six of these. It therefore seemed imperative that some simple method be devised to prevent this accident, and the following procedure was finally adopted, and has proved entirely adequate. The method is based, and its success depends, on two factors: first, that an angle is formed between the proximo-distal diameter of the nail head *in situ* and its imaginary continuation distally on the outer surface of the femoral shaft; secondly, that the cortex of the shaft is composed of hard bone.

The nail, in other respects of standard type, is provided with a hole drilled diametrically through its head, into which a slightly tapered stainless steel pin, one and a quarter inches long, is made to fit. The pin is so graduated that wedging occurs when half its length (five-eighths of an inch) protrudes through the hole.

The technique is as follows. When the nail is about to be inserted care is taken that this be done with the tunnel through its head lying in a proximo-distal direction. When the nail has been hammered home and the fracture impacted the tapered pin is passed through its head from above downwards, so that it impinges obliquely on to the femoral shaft. There is no difficulty in effecting penetration by a few sharp taps with hammer and punch until the pin will go no further into the bone, it having become firmly wedged into the nail head. The distance of penetration into the bone will vary slightly in different cases, but provided this is not less than a quarter of an inch, complete immunity from extrusion of the nail has been secured. Should it be necessary for any reason to withdraw the nail, the tapered pin can easily be removed by seizing its free projecting end with suitable pliers and combining a to-and-fro rotation movement with traction in its own axis. It is admitted that this method requires a longer incision than that used by some surgeons to-day, but in my experience a four- or five-inch incision causes no appreciable shock, and heals as quickly as a two- or three-inch one. The longer incision is surely a small price to pay for security against a mishap, the occurrence of which completely mars an otherwise successful operation. The tapered pins and suitably drilled nails were prepared for me by Messrs. Down Bros., who inform me that any existing models of "tri-fin" nails could be supplied with drilled head and cross-pin, to be used in accordance with the above-described technique.



[1] Johannsen, Sven: *Extra-articular Osteo-synthesis of Collum Femoris Fractures*, 1934.

NOVASAPA ANTISEPTIC

Novasapa is an antiseptic solution which the makers claim will in the cold kill most free living organisms in less than a minute, and when boiling will kill anthrax spores in a minute. The makers (Pharmaceutical Manufacturing Co., Ltd., 39, Aldersgate Street, E.C.1) state that it contains trichloriodine and vuzinotoxin hydrochloride. The former compound is known to have an exceptionally good disinfectant action on spores, while the latter has a very powerful lethal action on free living bacteria.

BRITISH EMPIRE CANCER CAMPAIGN

THE DUKE OF YORK ON PROPAGANDA AND RESEARCH

The annual general meeting of the British Empire Cancer Campaign was held at the House of Lords on November 23rd, the DUKE OF YORK presiding.

In a brief address His Royal Highness stated that the total sum granted for cancer research by the Campaign in 1936 would amount to over £35,000. This included handsome grants to the cancer research departments of many of the leading hospitals. The results of the Empire Day appeal had made it possible to meet every request for funds brought forward by the scientific committees. All the research centres were working at full pressure, and the educational propaganda scheme was being continued and developed until it covered the whole country. No effort was too great to reduce cancer mortality, and this could only be brought about by inducing people to seek medical opinion upon the appearance of any doubtful symptoms. Steps were being taken to bring about closer collaboration between headquarters and the branches of the Campaign, which had their own research centres. He congratulated Professors Kennaway and Cook on the award of the prize for work of highest merit submitted to the recent International Cancer Conference at Brussels.

In a reference to the sympathy of his family with all work on the cancer problem, he mentioned the deep interest taken by the late King, who was Patron of the Campaign, and by Queen Mary, also by his grandfather, King Edward VII. It was very gratifying that King Edward VIII had consented to become Patron. The death of Lord Reading, chairman of the Grand Council, was a severe loss to the Campaign. Lord Hailsham had consented to be his successor.

VISCOUNT DAWSON OF PENN, in thanking the Duke, mentioned that there was promise of further co-operation between the Campaign and the Imperial Cancer Research Fund, not only in exchange of information, but even in exchange of work. Mr. STANFORD CADE proposed the re-election of the members of the Grand Council, and mentioned that for the first time the Council included two ladies, the Dowager Marchioness of Reading and Lady Barrett. Professor GREY TURNER seconded, and the re-election was approved. LORD WARDINGTON, chairman of the Finance Committee, made a statement on the balance sheet. Although the income was some £9,000 less than during the previous twelve months, there had been an increase, also of about £9,000, in research expenditure, and there remained a balance on the credit side of just over £7,000.

Recent Research

Sir CHARLES GORDON-WATSON, in a statement on the annual report, said that a comparison of this thirteenth report with the first would reveal an amazing acceleration of cancer research, not only in England but throughout the Empire. It would also show how some of the aims of the Campaign had been realized in the widespread co-ordination of cancer research and the effective subsidy of research work. Skilled research workers were being attracted in ever-increasing numbers, and thanks to the generosity of those who supported the Campaign it had been possible to afford them adequate financial support whenever the scientific committees thought such support was justified. One of the important functions of the Investigation Committee (of which the speaker is chairman) was, he said, to sift out the good from the bad. The committee received applications from every kind of quack and also from many others who were eager to help the research, but who could not satisfy the experts that their proposed lines of research were likely to be fruitful.

It would be impossible to outline in a few remarks, Sir Charles Gordon-Watson continued, the interesting advances in cancer research during the past year. Special attention had been directed to the nature of those changes in cells which were associated with the origin of cancer. The cancer cell is now regarded no longer as an interloper, but as a variant of its normal prototype, though differing from it both in metabolism and in growth rate. What emerged from recent research was that the variations which occurred were produced, not by a process of growth stimulation, as might be expected, but as a sequel to long-continued growth inhibition.

Very valuable work had been carried out on the cancer-producing properties of certain oils used in machinery. It had been found that the carcinogenicity of a mineral oil varied directly with its refractivity. Further research along these lines would doubtless have an important bearing on one form of industrial cancer, and might help to explain the apparent increase in lung cancer, in view of the suggestion that there was a relationship between this and exhaust gases. He also touched on the work done on the filterable agent of fowl tumours. Evidence had now been obtained that a filterable cell-free agent could be extracted from a mouse sarcoma, which agent, after injection into other mice, produced a tumour transmissible by grafts. If this work was confirmed it would seem to prove that a cell-free agent capable of causing tumours might also be present, in certain instances, in mammalian tumours. The exact nature of these cell-free agents was still very obscure.

Definite progress had been made in the treatment of cancer by *x* rays and radium. It had long been recognized that success or failure in this field depended upon accurate or faulty dosage. The use of the radium bomb had been extended, and a comparison of different units was bound to afford interesting information. In *x*-ray therapy the general tendency was towards an increase in wave-length. Most of the *x*-ray therapy in recent years had been carried out with 200 kW, and now it was possible to compare these results with those recently obtained at the Cancer Hospital, working with 400 kW, and at Mount Vernon Hospital, with 700. A new million-volt apparatus would shortly be working at St. Bartholomew's, and then there would be further opportunity for comparison. Research on ultra-short-wave apparatus had also taken place, and this seemed likely to prove of value in cancer in situations where close contact was desirable.

The report was adopted and the meeting terminated, being followed by a meeting of the Grand Council at which block grants totalling to £21,650 were made to seven institutions, and a further £5,295 to certain other institutions and individuals in connexion with specific schemes of research.

The Annual Report

The document adopted at the above meeting, and to some extent summarized in Sir Charles Gordon-Watson's speech, runs to over 300 pages, and contains brief reports from a number of research departments, institutes and clinics, and branches of the Campaign in the United Kingdom and the Dominions. The reports from the research institute of the Royal Cancer Hospital, the research laboratories of Middlesex Hospital, and especially the cancer research departments of St. Bartholomew's, Westminster, and Mount Vernon, are really substantial treatises, in some cases illustrated, and contributed to by workers in different fields. The report from St. Bartholomew's, for example, contains the record of an investigation into the results of deep *x*-ray therapy in malignant disease, a report from the surgical professorial unit on the radium treatment of carcinoma, a report on an investigation into the mode of entry and spread of cancer cells in the lymphatics, a report on the pathology of gastritis with special reference to a pre-carcinomatous condition of the gastric mucosa, and a report on the carcinogenic properties of oestrin, based on an experiment with mice, also notes on various work proceeding in the physics department. A report from the Marie Curie Hospital consists principally of well-set-out statistics. The Yorkshire Council, which mourns the death of its chairman, Lord Moynihan, embodies in its report an account of work carried out in the department of experimental pathology and cancer research in the University of Leeds and in the field laboratory of Sheffield University. The Birmingham Branch brings forward reports from the

biochemical laboratories and radiation department of the university. There are many other reports, too numerous to mention, not only from research centres in this country, but over-seas, and those from Sydney, Brisbane, and Toronto are specially voluminous. If the Campaign rendered no other service than to bring together these accounts of parallel or convergent work it would have made a great contribution to the study of the cancer problem.

Regional Distribution of Cancer

An outstanding feature of this year's report is a general survey of the incidence of cancer in England and Wales, accompanied by a number of maps showing shaded areas to indicate by counties the cancer mortality over a period of years. This is the work of Dr. Percy Stocks, who has been assisted by his colleagues at the General Register Office. He has made an elaborate analysis of the half-million deaths from cancer which occurred in the period 1921-30, and shows the regional distribution of cancer in different organs of the body and for different age groups. The fifteen maps show the position as regards cancer of the oesophagus, stomach, intestines, rectum, liver, gall-bladder, and pancreas, skin, lung, and breast. A further series is promised at a later date for cancer in other sites and amplifying the analysis already given. The maps show for the different counties the actual mortality per cent. of that expected from the distribution of the population by age and class of district. We cannot enter into Dr. Stocks's statistical technique, which has earned the warm commendation of Professor Major Greenwood, and we can only give a few inferences drawn from a superficial study of the maps and tables.

In cancer of the oesophagus, where male deaths greatly exceed female, only the former have been taken into the computation. There is a definite region of high mortality in the South-East of England, especially high rates being found in a crescent-shaped area north of the Thames, formed by the counties of Warwick, Oxford, Berkshire, Buckingham, Middlesex, London, Essex, and Suffolk West. A very low mortality is recorded in parts of Lincolnshire and Yorkshire and in Westmorland and Cornwall. Cancer of the stomach has two definite regions of high mortality, one extending from Wales to the north-west and extreme north of England, and the other near to the Wash. The highest rates occur in Wales, the worst county being Carnarvon. The best areas are Suffolk and one or two South-Eastern and West Midland counties. In cancer of the intestines, where only female deaths have been dealt with, the distribution of mortality is more uniform. The northern group of counties, comprising Northumberland, Cumberland, West Riding, Durham, and Cheshire, is characterized by a definitely high mortality, while Devon, Somerset, and Glamorgan, and the administrative counties of Monmouth, Nottingham, and Shropshire, the Gloucestershire county boroughs, and Liverpool are distinguished by low mortality. Cancer of the rectum and anus is productive of mortality almost twice as great in males as in females, and the present study deals with males only, and reveals a much more definite regional distribution than appears for intestinal cancer. The mortality for ages 25 to 65—over 65 there appears to be a different distribution—is highest in Warwick, the Kesteven and Holland divisions of Lincolnshire, Cambridge, and Stafford, all these, except Holland, being counties of low mortality from gastric cancer. Cancer of liver, gall-bladder, and pancreas has a low mortality rate in London and the Home Counties, whereas the North of England and the counties near the Wash, which have a high gastric cancer rate, have a mortality below expectation for cancer in these sites. Skin cancer in males shows very high ratios of mortality in the Holland division of Lincolnshire, Lancashire, Cornwall, Northumberland, and some counties in North Wales, and there are significantly high figures also in Durham, East and West Ridings, Suffolk East, and Monmouth. The maps and tables for cancer of the lung show how mortality rises with urbanization, but, of course, it is impossible to show how much of the excess must be laid at the door of diagnosis and how much is due to an actual higher incidence of lung cancer in the towns. The incidence of cancer of the breast was higher in the South of England than in the North, and lowest in Wales.

Two other maps are given, for a six-year period only (1921–6), showing the mortality for cancer of all sites. For males the "black" counties are London, some counties near the Wash, and Lancashire, Cheshire, and North Wales, and for females, again parts of North Wales. In looking through the whole series of maps one's attention is drawn to the recurring "blackness" of North Wales, except for cancer of the breast, the liver, and the lung. The most uniformly happy parts of the country in respect of low cancer mortality appear to be Devonshire and the North and East Ridings. It is arguable how much, if any, significance attaches to these regional distributions. Cancer is no respecter of county boundaries; how far in a geographically small country it may be influenced by meteorological zones or by prevailing industries has still to be determined. Moreover, one has the feeling that peculiarities in local distribution, especially with regard to cancer of the lung, may be influenced by lack of uniformity in diagnosis. So far as this work has gone the features to be noted are the contrasts between the clear-cut regional distributions of oesophageal and gastric cancer, the close resemblance of the distribution of oesophageal to that of rectal cancer, and the remarkable distribution of lung cancer.

Promising Lines of Study

In a very able summary the editor of the report, Mr. J. P. LOCKHART-MUMMERY, indicates some of the directions in which study has been pursued. Work carried out at Mount Vernon has been directed to the question as to whether cancers arise from changes in a single cell or in a number of cells. The growth rate of warts arising as a result of tarring mice has been observed, and the inference is that the cell change which results in the production of a wart from tarring the skin begins in a single cell and not in a large group of cells. Attention is also drawn to some studies made at the Royal Victoria Infirmary, Newcastle-upon-Tyne, on the metabolism of cancer cells, in which the present position is summed up in the statement that the metabolic peculiarities associated with tumour growth are a combination of aerobic glycolysis with a lowered efficiency in carbohydrate oxidation indicated by a lowered respiratory quotient. The action of colchicine on cell division has been studied at the Royal Cancer Hospital. This alkaloid has the effect of arresting cell division in the later stages of mitosis, even when it is applied in very dilute solutions. The study of precancerous conditions has been pursued at the Marie Curie Hospital and at Leeds and elsewhere, especially on the pathological conditions assumed to precede cancer of the cervix uteri. It was generally believed that cervical lacerations and chronic cervicitis were important factors in the aetiology of cancer of this region, but a clinical study at the Marie Curie Hospital suggests that there is little in the evidence to support this view. The mechanism of spontaneous recovery from implanted tumours is a subject to which cancer research workers have devoted special attention during the last year. It has been shown that the serum of rats in which the Jensen rat sarcoma is regressing contains, at a certain stage, "antibodies" which are toxic to cultures of the same tumour cells, and it is considered probable that these toxic substances or antibodies are an essential part of the mechanism by which animals occasionally recover from an implanted tumour. The rapid increase of deaths ascribed to cancer of the lung has led at the Royal Cancer Hospital to an analysis of 18,280 death certificates for cancer of the lung and larynx for the years 1921–32. The increase appears to be spread fairly uniformly over the community.

These are but samples of the numerous activities recorded in this volume, which may be regarded as a presentation of the state of cancer research to-day, so far at least as the British Empire is concerned.

British Medical Journal

SATURDAY, DECEMBER 5th, 1936

INDUSTRIAL MEDICINE

The association of certain more or less well-defined symptom-complexes with certain occupations has been recognized for centuries. Hippocrates knew something of the respiratory symptoms of metal diggers, and Pliny speaks of the need of respirators for men working in dusty conditions. Hippocrates seems to have recognized lead as the cause of saturnism, and Nicander in the second century B.C. correlated the major symptoms now associated with plumbism. In spite, however, of these and many other similar observations which served to show that occupation could give rise to diseases making the most deadly inroads into the health of the workers, the progress of organized effort to prevent the dangers in hazardous industrial processes has been painfully slow. There is no simple explanation of this on the lines, which might be adopted by many, that it was due to the heartless indifference of employers, although no doubt in many individual cases such a factor was present. The pursuit of wealth perhaps made men careless of the means of achieving it, but reflection should have shown that loss of efficiency and health in the human machine must slow down production.

The immense drive in industrial development in the nineteenth century brought in its train an unheard-of degree of suffering from occupational diseases, and legislation lagged far behind in the action necessary to protect the employee. Resistance to such legislation does not come only from employers ; the workers can often be just as refractory in adopting different modes of operation or adapting themselves to safe ways of working. But things have changed. Industry has realized that in its own interest it must make every effort to safeguard its employees, and Governments do not hesitate to enforce stringent rules for the protection of the workers, although, as was pointed out in our correspondence columns a short time ago, reforms are needed in the new Factory Bill which the Government has promised to introduce next year. The legal limit of working hours for women and girls is not compatible with good health. For these purposes the medical profession must be brought into active co-operation. Many of our number are employed as works medical officers, and the function they perform is an integral part of the organization of the factory. Not only must the works doctor see to it that men taken on for certain jobs are reasonably fit to carry them out from the health point of view, but he must also see, in co-operation with works engineers and safety officers, that the conditions under which the employees are required to labour are not prejudicial to their physical and mental health. To be able to do this adequately he must have adequate knowledge of the signs, symptoms, treatment, and prevention of occupational disease. Since on the whole medical education takes little account of occupational diseases, he is forced to rely on his own study to obtain the knowledge which is relevant to the particular circumstances of the industry he serves. This is a none too easy task. The constant advent into industry of new products and new processes makes it essential for the works doctor to be constantly on the look out for trouble. He must develop a keen clinical sense and be ever ready to recognize suspicious manifestations in the physical condition of the men under his care. Nowadays the larger factories institute inquiry into the physiological or toxicological properties of new products, the results of which are placed at the disposal of the works doctor, but even then he is never quite certain that man will not react quite differently from animals. In certain branches of factory practice he has to rely entirely upon clinical observation, as, for example, in skin diseases arising in industry. The psychological difficulties which arise in the minds of workmen when investigation of a suspected occupational cause of a disease is instituted makes the post of works doctor very difficult. The question of compensation introduces another complexity, a complexity which need not worry the works doctor unduly so long as his decisions are made on objective medical grounds. Here we should like to draw attention to Dr. G. P. Crowden's article on page 1155, in which he says: " I hope the day is not far distant when a comprehensive post-graduate course in preventive medicine in industry will be provided not only in London but elsewhere, and that those who take it and obtain a diploma or degree will thereby be fitted to become medical officers in a national industrial health service."

In the dissemination of knowledge on occupational disease large medical centres can be of great help, and we welcome the publication of Dr. Donald Hunter's lectures on this subject as a very useful survey of the field.[1] Dr. Hunter's facilities at the London Hospital have enabled him to make valuable investigations into the pathology and clinical aspects of these diseases as they occurred in his patients, who were drawn from a large industrial area in London. Some of the problems raised in these lectures are crying out for solution. Notable among them is the problem of silicosis. This scourge has been attacked with vigour, but much remains to be done, and, as pointed out by Dr. Hunter, we have as yet no means of being sure that the measures taken will really be effective in preventing the later appearance of pulmonary fibrosis. Another urgent problem is that of the dermatoses. It is often difficult to know to what to attribute the skin eruption, and quite commonly it is the method of cleansing the skin which precipitates an occupational dermatitis. Individual idiosyncrasy is without doubt a powerful factor, and every works doctor knows that there are

[1] *London Hospital Gazette*, 1936, vol. xxxix, Nos. 1, 2, 3, and 4.

some workers who react with an almost immediate outbreak on the skin when they come into contact with products apparently innocuous to other workers. Methods for effective protection of the skin and other physiological systems must be devised, and industrial medical men must co-operate with specialists in dealing with their special problems. Co-operation with the Home Office medical inspectors will often elicit information which otherwise may take a long time to obtain. Both managements of industrial concerns and employees must be educated to the need for constant vigilance in combating the manifold hazards of industrial life. Contact between lecturers with the knowledge and experience of Dr. Hunter and medical societies and industry would encourage advances in special branches of occupational medicine. The work is of national importance, and must be pursued with the same energy and speed which industry applies in the ever-expanding fields of invention and production. The need is evident, and the time may soon be ripe, for the establishment of a National Industrial Health Service in order to ensure that, without delay, full use is made of the results of medical and scientific research in the fields of preventive and curative medicine in industry.

AETIOLOGY OF THROMBO-ANGIITIS OBLITERANS

The growth of what may be termed the physiological approach to clinical medicine during the last ten years has revolutionized our understanding of the disturbances of circulation in the limbs and our ability to diagnose and treat them rationally. The ability to prevent, or appreciably to stay, the course of peripheral vascular disease has, however, improved but little, and cannot be expected to do so until there is a more complete knowledge of the agents bringing about the pathological processes in the vessels. Of these diseases none is more disabling or relentless in its course than thrombo-angiitis obliterans. This disease is characterized by discrete thromboses which usually begin in the medium-sized arteries of a lower extremity and, as time goes on, involve successively the larger and smaller arteries. The upper limbs are also affected in the later stages, and superficial thromboses in the veins, one form of thrombophlebitis migrans, occur in about 25 per cent. of cases. Recently thrombosed vessels show evidence of inflammatory change, their walls being infiltrated by leucocytes. Although the disease is commoner in Jews than in Gentiles, there is no evidence that heredity plays any direct part in its production, and by exclusion its cause must be looked for either in infection, or in deficiency or excess of some chemical agent. No dietary abnormality is known in thrombo-angiitis, but most of those affected with the disease are heavy cigarette smokers. Contemporary opinion inclines strongly to the view that tobacco plays some part in determining the lesions, and there is evidence that the course of the disease may be to some extent arrested by its avoidance. Two facts, however, stand in the way of accepting tobacco as the sole, or necessarily the chief, agent—namely, that about 1 per cent. of patients claim to be non-smokers, and that no lesions akin to those seen in the human disease have ever been produced by it experimentally.

The alternative view that this is primarily an infective disease has many adherents, notably Buerger, who first described it, but so far no infective agent has been demonstrated ; the variety of organisms that have been cultivated from the blood and amputated extremities is sufficient testimony to their being either contaminations or secondary invaders. Nor has there yet been any clear demonstration that the disease may be transmitted by human material to healthy men or laboratory animals ; although Buerger[1] found that implantation of freshly thrombosed veins from patients with thrombo-angiitis alongside the healthy ligated veins of other patients in the quiescent stage of the same disease would reproduce the lesions ; and Horton and Dorsay[2] found that in seven of twenty-nine instances thrombosis of the femoral vessels in rabbits was caused by implanting alongside them thrombosed vessels from patients suffering from thrombo-angiitis. Here it is of interest to note the recent description by Allen, Lauderdale, and Ranger[3] of a case of supposed transmission of thrombo-angiitis obliterans from man to man. A surgeon of 46, who smoked forty cigarettes a day, accidentally punctured his right middle finger with a spicule of bone from the toe which he was amputating from a patient with thrombo-angiitis. No local reaction followed, but a month later the finger became blue or white on exposure to cold, and three weeks later similar changes appeared in the right ring and little fingers. Six months after the accident he was examined and found to have signs of structural arterial disease in the named fingers but in no other part of the body. *X*-ray examination revealed no cervical rib. From the account given it is extremely likely that the owner of the offending toe was suffering from thrombo-angiitis, but it cannot be said of the surgeon that signs of arterial obliteration in three fingers are diagnostic of this disease. Although tobacco could not be excluded as a contributory cause in this instance, the case is suggestive enough for us to hope that the authors will duly record any later developments that confirm this diagnosis. Finally, let it be added that no theory of the aetiology of thrombo-angiitis obliterans can be complete which neglects the peculiar sex incidence of the disease ; in a recent series, only 2 of 2,000 were in women.[4] In this connexion the experiments of Macgrath[5] may be relevant. This author found that a suitable dose of theelin would protect the female rat, but not the male, from gangrene of the tail in response to injection of ergotamine.

[1] *Arch. of Pathology*, 1929, vii, 381.
[2] Ibid., 1932, xiii, 910.
[3] *Proc. Staff Meetings Mayo Clinic*, 1936, xi, 641.
[4] Silbert: *Ann. of Surg.*, 1935, ci, 324.
[5] *Arch. Int. Med.*, 1935, lv, 942.

PREVENTION OF PERITONEAL ADHESIONS

We might reasonably claim to-day that surgical opinion in regard to the significance of peritoneal adhesions is at least more balanced than it was but a short time ago, when one group of surgeons were opening the abdomen and dividing adhesions for the relief of abdominal discomfort, while at the same time for similar symptoms another group were opening the abdomen and endeavouring to produce adhesions. By the one group the bowel was regarded as being fixed by adhesions and unable to function normally ; by the other it was regarded as too mobile and requiring fixation for it to function normally. Fixation operations are now rarely practised, and surgical effort is for the most part directed against the formation of post-operative adhesions, which are liable to interfere with the normal movements of the gut and may lead to its obstruction. These adhesions may be the result of peritoneal inflammation or of injudicious handling by the surgeon, but, in addition to these factors, Ochsner and Storck[1] of New Orleans, believing that there are subjects who have an abnormal tendency to form fibrous tissue, postulate another cause, which may be called a "keloid tendency," or an "adhesions diathesis." Among those who possess this tendency, the proteolytic ferment derived from leucocytes in the peritoneal exudate and normally responsible for the disappearance of fibrinous adhesions is unable to bring about their resolution. Ochsner and his co-workers have studied peritoneal adhesions from the point of view of preventing, or at least limiting, their formation after abdominal operations. They have tried to supplement a possible deficiency in normal proteolytic enzyme by the addition of such substances as papain and trypsin. Experimentally, they found that in animals the introduction of saline into the peritoneal cavity limited the re-formation of divided adhesions. Trypsin-containing solutions produced a much greater limiting effect, and those containing papain the greatest of all. The animal experiments were followed by attempts to apply the results clinically, and, after the introduction of a papain solution of strength 1 in 20,000, observations were made on a number of patients in whom adhesions had been divided, in some cases several times, one patient having had twenty-two such operations. Many of these were regarded as having an "adhesion diathesis." In this group of multiple operations there were 122 patients on whom 317 operations had been performed: 89 per cent. of the cases studied were treated with papain in an attempt to prevent the re-formation of adhesions after their division. These cases were then observed over periods varying from a few months to five and a half years. There were thirty-seven cases in which subsequent operations made it possible for the presence or absence of adhesions to be determined. These cases constitute the crucial test, because the clinical absence of any symptom suggestive of adhesions does not prove that there are none. Twenty-two of the thirty-seven cases were entirely free from adhesions, although many and massive ones had been present before their division and the introduction of papain, and in the remaining cases those present were less extensive than they had been at the previous operation. Ochsner and Storck conclude that the introduction of papain solution into the peritoneal cavity following the division of adhesions is of value in preventing their re-formation. As papain loses its efficacy very rapidly when in solution, it must be kept in dry form and a solution prepared just before use. There were no deaths attributable to the use of the papain solution. In those unfortunate patients, therefore, who tend to re-form adhesions, and who may be regarded as having the adhesion diathesis or keloid tendency, whatever this may be, the use of intraperitoneal papain solution would appear to be well worthy of consideration.

[1] *Ann. of Surg.*, October, 1936, civ, 736.

IS NATIONAL INTELLIGENCE DECLINING?

Since the Report of the Mental Deficiency Committee (Wood Report) was published in 1929, speculation has been rife as to whether the incidence of mental defect in England is increasing. There is little direct evidence available to decide this question, since, to obtain accurate information, large representative groups of children would have to be tested by the same standards at long intervals. Recently an attempt has been made to discover the mean intelligence of the community in a typical rural district and in a typical urban one, and to infer from these figures whether a decline in intelligence is likely in the future. In an extensive survey Dr. R. B. Cattell[1] applied specially designed intelligence tests to all the 10-year-old children except the imbeciles and idiots in certain districts. The distribution of mental age was ascertained, and, in the urban area, the mean intelligence quotient was found to be normal ; in the rural area, however, the mean was definitely subnormal. The number of brothers and sisters of each child was ascertained in order to investigate the relation between birth rate and intelligence. In the urban area the largest families were those which contained children with an intelligence quotient of 70 to 80, and in the rural area the greatest fertility was associated with even lower intelligence. Having brought forward arguments to show that intelligence is inherited, Dr. Cattell proceeded to weight the distribution of test scores according to the size of family. This weighting process enabled him to predict a probable decline in intelligence in succeeding generations. Mental deficiency is considered by this authority to be increasing rapidly: in thirty years we are to expect a 24 per cent. increase, and more than half the population will be mentally defective in three hundred years. In rural areas children of scholarship grade will be reduced by more than one-third in one generation.

Before these depressing conclusions need be accepted there are some points which should be questioned. In the first place, it is not clear why Dr. Cattell has rejected the regular standardized tests, such as the Binet and the Otis. The results of applying his special tests show a greater variation of intelligence quotients than any previously reported. This suggests that the tests are either unreliable or not satisfactorily standardized. It will require much more work to prove that intelligence, as measured by the Cattell tests, is not affected by environmental changes. Moreover, a prediction is open to criticism if it is based on the assumption that brothers and sisters of a given child will have offspring of the same intelligence as that child. This may be

[1] *Eugenics Review*, 1936, xxviii, No. 3, 181.

reasonable at the upper end of the intelligence scale. At the lower end of the scale, owing to the scattering, some of the brothers and sisters may reasonably be expected to be imbeciles of too low a grade to have families of their own. Again, it is difficult to believe that, corresponding to the 3,700 children examined, there were not about ten imbeciles excluded from the survey. It may be wondered what assumption Dr. Cattell would make about these children. They are likely to have come from normal-sized families, but it would be absurd to suppose that their brothers and sisters, who would be assumed to be imbeciles, would contribute heavily to the proportion of imbeciles in the next generation. The majority of brothers and sisters of imbeciles are normal and have normal offspring. If, as Dr. Cattell suggests, national intelligence is declining at the rate of 10 per cent. in a hundred years, it should not be necessary to go very far back into history to find nearly every person a genius: to avoid this absurdity, Dr. Cattell has to assume that the association between birth rate and intelligence is only a recent phenomenon. National intelligence may be declining, but it is very doubtful whether the decline is as rapid as these recent investigations suggest, because the compensating infertility of individuals of very low intelligence has not been taken into consideration in making the prediction.

CONTROL OF SYPHILIS IN AMERICA

For some time it has been realized that syphilis control has not been tackled as successfully in America as, for example, in Great Britain, Denmark, or Sweden. It is true that the problem is more difficult owing to a number of factors—the vast size of the country, the large number of States comprising it, and, more particularly, the negro population—but both lay and medical opinion are being aroused to demand a more forward policy. It has been computed that 12,000,000 persons in the U.S.A. are suffering from syphilis; that annually some 1,100,000 come under treatment for the first time, roughly half of whom are early and half are late cases; and that this number would probably have to be multiplied by three if all cases could be detected. At a recent conference of State and Territorial health officers with the Surgeon-General of the U.S. Public Health Service papers were read by Drs. Vonderlehr, Smith, Moore, Casselman, Stokes, and Nelson,[1 2] who gave their views on various aspects of the problem. These papers overlapped to some extent, but the consensus of opinion was that a long-term policy must be adopted and pushed with energy, and that adequate funds should be allotted for the purpose. Syphilis is an insidious disease, is easily spread in its early stages, is the cause of much invalidity in its later stages, and requires a considerable amount of treatment over a comparatively long period to eradicate it. It is most desirable that treatment should be carried out by a full-time V.D. officer who not only has had due experience in the management of syphilis, but who has "drive," tact in dealing with patients so that they do not default before completing treatment, and administrative experience. This section of the Health Department should be in close touch with the others, and the work should be unified between adjoining areas; the help of the medical profession and voluntary organizations should also be enlisted. In order to bring the maximum number of cases to treatment it is first necessary to find them. This can be done by serological surveys—such as testing the blood of every patient who applies for treatment at hospital—and by tracing sources of infection and contacts. Education of the public, many of whom have no knowledge that they are suffering from the disease or of its dangers, is most important. Until lately the mere mention of syphilis was taboo, but nowadays people talk more freely on the subject, and there are even newspapers which are willing to give the matter publicity in special articles. Films, lectures, posters, and the wireless could all add their contribution. Education of the medical profession is also necessary. The subject should be given greater importance in the student's curriculum, and the interest of general practitioners should be stimulated and post-graduate classes of instruction organized for them. Moreover, more might be done for those who need help in their problems. Specialists should be available who would answer questions by letter or telephone, or, better, consult with the doctor over the case. Clinics should function everywhere so that all patients can be treated adequately. Treatment should be free, because there is little doubt that the cost deters many from seeing the affair through to the end, and drugs should be issued free to those who are capable of administering them. In addition, State laboratories should be set up where dark-field examinations can be carried out—if possible the patient should attend, but, failing that, serum can be sent by post in a capillary tube—and serological tests performed. By adopting some such suggestions, it is held, the problem can be tackled with reasonable hope of success, and one of the most serious diseases affecting the community brought under control.

[1] *Journ. Amer. Med. Assoc.*, Sept. 5th, 1936, cvii, pp. 782, 784, 787.
[2] Ibid., Sept. 12th, 1936, pp. 863, 866, 872.

MEDICAL EXAMINATIONS FOR FLYING

The manual on *Medical Examination for Fitness for Flying* is issued in its fourth edition[1] this year. Its eighty-one pages are divided into two parts, dealing with the examination and with assessment respectively, and ten appendices. It constitutes a precise and detailed guide to procedure in the examination of candidates for the Royal Air Force and for A and B licences in civil aviation. Since the formation of the R.A.F. its medical department has acquired from observations, statistics, and research a wide experience in its own specialized branch of medicine. On deductions from this experience are based the form and method of examination. Although aircraft accidents are still too frequent both in the Service and in commercial aviation, every possible precaution seems to have been taken to minimize the chance of failure in the human element. The examination is indeed so searching that many war-time pilots, including some with excellent fighting records, would have been unable to pass it. In modern flying the eyesight and the hearing of the pilot must be without defect; nervous stability is essential for a cool head in emergencies, and rapid co-ordination is needed to produce instant action,

[1] Air Publication 130. Fourth edition. 1936. *The Medical Examination for Fitness for Flying (Royal Air Force and Civil)*. London: H.M. Stationery Office. (2s. net.)

when a delay of seconds may spell disaster ; an ample lung capacity is necessary for flying in the rarefied atmosphere of high altitudes ; and, finally, any conditions, as, for example, fits, fainting attacks, or severe migraine, which may incapacitate a pilot in the air, are inadmissible. Several special tests are employed in the medical examination. In the breath-holding test it is necessary to hold the breath for a full minute, the nostrils occluded by a nose clip. In the self-balancing test the candidate stands with feet close together, arms at the sides. He then flexes one knee to a right angle, without moving the hip, and, having obtained his balance, tries to remain steady in this position for fifteen seconds. The knees are not permitted to touch, and the test is applied to both legs separately, three attempts being allowed in each case. For the endurance or 40-millimetre test the candidate must blow the mercury in a U-tube manometer to a height of 40 millimetres, and maintain it there for fifty seconds, while in the expiratory force test he is expected to send the mercury up to 110 millimetres. Great care is given to the examination of the pulse rate and the estimation of the blood pressure. In the former the sitting pulse, the response to change of posture, the response to exercise, and the time of return to normal are all recorded ; in the latter at least three readings are taken of systolic and diastolic pressures. The emotional factor is said to account for systolic pressures of up to 160 being relatively common on first examination of R.A.F. pilots, but this is not regarded adversely, provided that the diastolic pressure is between 60 and 80, unless there is other reason to suspect cardiovascular or renal disease.

SCIENTIFIC PROGRESS

The general subject of the 1935 Sir Halley Stewart Lectures was the progress of science. They were by Sir James Jeans on "Man and the Universe," Sir William Bragg on "The Progress of Physical Science," Professor E. V. Appleton on "The Electricity in the Atmosphere," Professor E. Mellanby on "Progress in Medical Science," Professor J. B. S. Haldane on "Human Genetics and Human Ideals," and Professor Julian Huxley on "Science in Relation to Human Needs." These lectures have now been published.[1] Each of them, as might be expected from the name of its author, is both authoritative and interesting. The last three are those which are likely to be of most direct interest to members of the medical profession. Professor Mellanby sketches in a few pages the now familiar story of the development of medicine, and then reviews a few features of the great outburst of activity in medical research since the beginning of the present century, and of the application of the results of this research in practice. He concludes with a specific reference to the question of nutrition, and notes the curious fact that "it is possible for a manufacturer of umbrella handles and buttons to obtain large supplies of milk at the price of 5d. a gallon at a time when it is impossible to obtain the same milk for infant feeding at less than 2s. 4d. a gallon." Professor Julian Huxley's chapter contains a considerable number of admirable and striking illustrations of how the beneficial results of scientific research have been frustrated by general ignorance of the way in which they can be practically applied in industrial, agricultural, and social spheres of life, or by the active obstruction to such application offered by prejudice or vested interest. He shows graphically how relative expenditure on research in different fields—industrial, war, agriculture, health, social and psychological, in that order—is in almost inverse proportion to that which should obtain if human activities were directed to their proper ends. But perhaps the most valuable chapter of all at the present time is that by Professor Haldane. He deals with the two theories: that racial health necessitates the sterilization of the unfit ; and that some races are superior to others whose members are incapable of rising to the highest levels possible to humanity. His clear, commonsense, unbiased statement of the facts of human genetics as at present known is destructive of each of the theories he examines.

[1] *Scientific Progress.* London: G. Allen and Unwin Ltd. 1936. (7s. 6d.)

A GRANT FOR CHEMOTHERAPY

At the anniversary dinner of the Royal Society on St. Andrew's Day the Chancellor of the Exchequer, Mr. Neville Chamberlain, was the principal guest. Proposing the toast of the evening, he recalled the association that had always existed between the Royal Society and the Government, and said that in recent years this had taken on a new strength and intimacy, so that they might now look upon each other as partners in a common task—the advancement of science for the benefit of humanity. All useful applications of science were really founded upon the discoveries of the pioneers in pure research. Only within the last week or two, in response to a request from the Medical Research Council, backed up by the Department of Scientific and Industrial Research, he as Chancellor of the Exchequer had consented to a grant of £30,000 a year towards the establishment of an institute of chemotherapy. He wished that all the money he had to find could be devoted to objects so agreeable to himself. The president, Sir William Bragg, in his reply to the toast, said that this new grant promised by the Treasury was likely to be of immense benefit to mankind. The year 1936 had been remarkable for the gifts made to encourage research ; they showed that research was being more and more relied on in helping man to overcome evil and bring good.

We have to announce with deep regret the death of Edgar Hartley Kettle, M.D., F.R.C.P., F.R.S., professor of pathology, British Post-Graduate Medical School, University of London, and consulting pathologist to St. Bartholomew's Hospital.

We regret to announce the death, at Hereford, of Dr. J. Theodore Cash, F.R.S., regius professor emeritus of materia medica in the University of Aberdeen.

The Thomas Vicary Lecture before the Royal College of Surgeons of England will be given on Thursday, December 10th, at 5 p.m. by Dr. George W. Corner, professor of anatomy in the University of Rochester, U.S.A. His subject is "Salernitan Surgery in the Twelfth Century."

THE ENDOCRINES IN THEORY AND PRACTICE

This article is one of a series on Endocrinology contributed by invitation

PITUITARY TUMOURS

THEIR CLASSIFICATION AND TREATMENT

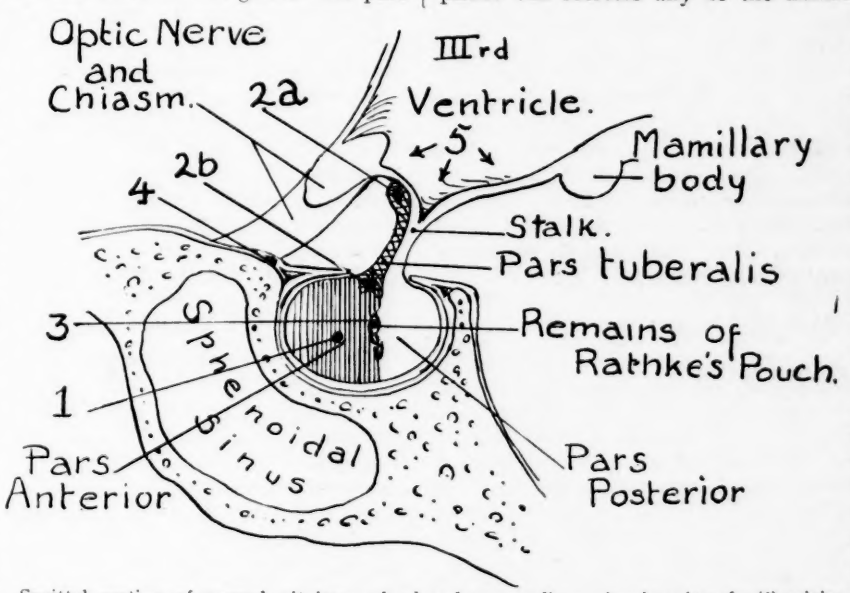
BY

J. H. BIGGART, M.D.

AND

N. M. DOTT, F.R.C.S.Ed.

Like the majority of animal pituitaries the human gland is composed of: (*a*) a large epithelial lobe or pars anterior; (*b*) a posterior lobe, which is composed of a specialized form of glial tissue—the pars nervosa; (*c*) the pars intermedia, which consists of epithelial cells similar to those found in the anterior lobe; and (*d*) a narrow epithelial investment of the stalk of the gland—the pars tuberalis — which covers the anterior surface of the stalk and is reflected on to the anterior part of the floor of the third ventricle. Theoretically tumours might arise from any of these constituent parts, but actually primary tumours are commonly found only in the anterior lobe and pars tuberalis. No primary tumours of the pars nervosa have been described, though this part of the gland is quite frequently the site of malignant metastases.



Sagittal section of normal pituitary gland and surroundings, showing site of: (1) origin of adenoma; (2*a* and 2*b*) suprasellar and intrasellar epidermoid tumour; (3) Rathke's pouch cyst; (4) meningioma of tuberculum sellae; (5) hydrocephalic distension of third ventricle.

Tumours of the Anterior Lobe

Histologically the anterior lobe is found to consist of three distinct types of cells. Some of them have a non-granular cytoplasm, and hence are called "chromophobe cells." Others—the chromophils—have their cytoplasm packed with granules, and according to their staining reaction these granular cells are further subdivided into eosinophils and basophils. Histological studies have suggested that the chromophobe cell is the mother cell of these two types, and that by a process of differentiation certain chromophobe cells may develop into eosinophils and others into basophils. This relationship can be easily understood from the following scheme.

Chromophobe

Pre-eosinophil chromophobe → Eosinophil

Pre-basophil chromophobe → Basophil

By ordinary methods of staining it is impossible to decide which chromophobes will develop into eosinophils and which into basophils, but by staining the Golgi apparatus it is possible to recognize the two types of transitional chromophobe cell.

The adenomas can be composed of any of these cell types. Chromophobe, transitional, eosinophil, and basophil adenomas may all occur. These tumours of the anterior pituitary are among the most common in the body. Routine examination of the human gland shows that they occur in about 10 per cent. of adults, and Costello gives even higher figures (22.5 per cent.). Only a small percentage of these ever become clinically apparent, the remainder consisting of nodules too small to give rise to any clinical symptoms. All types of adenoma are uncommon in children, and in the adult the chromophobe type is the most common.

Chromophobe Adenoma

The available evidence does not suggest that the chromophobe cell secretes any of the hormones of the anterior lobe. Hence the clinical symptoms of a chromophobe adenoma are the result of its pressure upon and ultimate destruction of neighbouring tissues. As the pituitary gland is enclosed in the bony sella turcica, which is covered by a strong dural diaphragm, any expanding lesion will compress and destroy the gland itself. In this manner the symptoms of hypopituitarism arise. The growth of the adenoma almost invariably produces an enlargement of the sella turcica. Subsequent growth of the tumour leads to distension of the dural diaphragm. Finally, the diaphragm gives way and the growth extends freely into the cranial cavity. It may attain to a very large size and be found to occupy the whole of the interpeduncular space, and even occasionally to extend laterally into the temporal lobe. This upward extension results in compression of the optic chiasm, but because of the site of the tumour hydrocephalus and papilloedema are rarely produced.

Histologically such tumours are found to consist of cells with a non-granular cytoplasm. Most often the cells have a somewhat alveolar arrangement, with a delicate wide-meshed stroma. Occasionally they are arranged in flat sheets resembling a pavement epithelium —the so-called struma—or in masses suggesting a papilliform growth. Mitotic figures are rarely discovered, and though the local spread of the tumour and its histological appearance may suggest that it is malignant, metastases do not occur.

Eosinophil Adenoma

The eosinophil cells secrete a hormone which is necessary for the normal growth of the body. Their destruc-

tion leads to pituitary dwarfism, while tumours composed of this cell type are associated with gigantism or acromegaly. In addition, the tumour compresses and destroys the normal gland, and some symptoms may be the result of loss of function of the basophil cells and of the posterior lobe. The eosinophil adenoma tends to be somewhat smaller than the chromophobe one, but occasionally it shows the same upward extension. Such large adenomas have a tendency to haemorrhage and subsequent cystic formation.

On histological examination the cells show no definite arrangement. There is none of the alveolar arrangement seen so often in the chromophobe adenoma. Usually the only stroma is that carrying the blood vessels. Many of the cells may be multinucleated. With specific granule stains the cytoplasm of the tumour cells is found to contain an eosinophilic granulation. In some examples, more especially those of small size, every tumour cell is packed with these granules. In the larger tumours, however, a somewhat different appearance is often observed. Many of the cells appear to be chromophobes, though rather larger than similar cells in the normal gland. Eosinophil cells occur in small groups throughout the tumour, and cells in which only a few eosinophilic granules are present are also seen. In fact, all stages in the transition of the chromophobe to the mature eosinophil cell may be found. Such a tumour is in reality a transitional adenoma, and because, in its total bulk, it contains an excess of eosinophil cells over what would be found in the normal gland the symptoms dependent on hyperactivity of these cells are produced. In the majority of cases of acromegaly which exhibit signs of chiasmal compression these transitional eosinophil adenomas are present.

Basophil Adenoma

Unlike the other types of adenomas, tumours composed of basophil cells are usually small, and may only be discovered on serial section of the gland. Hence they do not usually produce visual symptoms through pressure on the optic chiasm. The largest basophil adenoma we have seen measured 2 cm. in greatest diameter. A number of these adenomas, but by no means all of them, are associated with Cushing's syndrome of hypertension and obesity, but, unlike the eosinophil adenoma, with its associated disturbance of growth, the relationship is not a constant one, and the relation of the tumour to the production of the symptoms is by no means clear.

Histologically there is much resemblance in structure to the eosinophil adenoma. There are the same lack of alveolar arrangement and the same scanty stroma. The cells are irregularly arranged, and binucleated and multinucleated forms occur. Around the blood vessels and along the strands of stroma they tend to be columnar. With specific stains they are found to contain a basophil granulation. Tumours composed of cells in various stages of transition from the chromophobe to the mature basophil also occur. In those patients in whom the presence of the adenoma is associated with Cushing's syndrome the basophil cells of the anterior pituitary, but not in the adenoma itself, show a curious degranulation and hyalinization of their cytoplasm. Adenomas appearing in the absence of the clinical syndrome are not associated with this cytoplasmic change.

Epidermoid Tumours (Craniopharyngiomas)

Tumours of epidermoid epithelial structure are found in relation to the pars tuberalis. Frequently these tumours arise above the diaphragm of the sella, but they may take origin within the sella itself. They are tumours of youth and early middle age, for over 75 per cent. of them occur before the age of 40. When the normal pars tuberalis is examined one frequently finds small groups of squamous cells. These have been regarded as "cell rests," and it has been surmised that the epidermoid tumours arise from these islands of squamous cells. It is a curious fact, however, that the squamous cells are extremely rare in children, while they seem to become more frequent with age. It is possible, therefore, that they may represent a squamous metaplasia of the cells of the pars tuberalis rather than embryonic rests, and the tumours may also be of this nature.

Epidermoid tumours may be either solid or cystic. In the cystic form, which is the more common, a warty excrescence is usually found projecting into the lumen at the base of the cyst. Although the histological appearances of the tumour vary somewhat, it is always found composed of epidermal forms of epithelial cells. Some tumours have the usual histological structure of squamous epithelial growths, with cornification and the formation of epithelial pearls. Not uncommonly the histological picture is that of a basal-celled tumour, solid anastomosing masses of epithelium lying in a fibrous tissue stroma. This latter type may show much resemblance to the adamantinoma of the jaw. Fatty substances are frequently found in the stroma, and their calcification may lead to the recognition of the tumour on *x*-ray examination of the skull.

The frequent suprasellar origin of these tumours leads to an early development of hypothalamic symptoms, and later to those resulting from compression of the neighbouring chiasm and pituitary. They constitute a common cause of the syndrome of Fröhlich's dystrophia adiposogenitalis, and not infrequently give rise to diabetes insipidus.

Cysts of Rathke's Pouch

The true cyst of Rathke's pouch is somewhat rare, and is quite distinct from the epidermoid tumour or cyst. It is a pathological enlargement of the intraglandular cleft, which represents the end of Rathke's embryonic epithelial invagination from the stomodaeum. The cyst is lined by a single layer of columnar epithelium, often ciliated, which may be flattened by intracystic pressure. The lesion should be regarded not as a true neoplasm but rather as a pathological enlargement or distension of an embryonic vestige.

The cyst is intraglandular and intrasellar in origin. Its enlargement therefore destroys the gland. Rarely it attains sufficient size to protrude upwards into the cranial cavity and compress the optic chiasma.

Miscellaneous Tumours

A variety of tumours arise in the vicinity of the pituitary gland which closely simulate primary pituitary tumours in their effects. They may compress the gland and surrounding anatomical structures so as to produce hypopituitarism, bitemporal hemianopia, and similar "pituitary" symptoms. It is not possible here to do more than enumerate some of the more common lesions, such as meningiomas arising from the olfactory groove, anterior end of falx, or tuberculum sellae; gliomas of the optic chiasma; cholesteatoma, chordoma, and metastatic tumours in or near the pituitary. Though not neoplastic, aneurysm may constitute a tumour in the anatomical sense. The congenital saccular aneurysm arising from the internal carotid artery at the point of origin of its ophthalmic branch and those associated with the anterior communicating artery belong to the "pituitary tumour" group.

It should also be borne in mind that hydrocephalus from any cause, such as cerebellar tumour or chronic

adhesive meningitis, leads to distension of the third ventricle. The distended cyst-like third ventricle may act as a tumour in exercising injurious pressure upon the surrounding hypothalamic centres, the optic chiasma, the bony structure of the sella turcica, and the pituitary gland itself. Thus hydrocephalus secondary to disease elsewhere may give rise to Fröhlich's syndrome, to bi-temporal hemianopia, to stunting of growth, and to erosion of the sella turcica recognizable in *x*-ray studies.

(To be continued)

POST-GRADUATE TRAINING IN THE PRACTICE OF PREVENTIVE MEDICINE IN INDUSTRY*

BY

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The words "post-graduate" and "preventive" have been deliberately included in the title of this paper for the following reasons. "Post-graduate" is used because it is essential that a sound basic training in medicine, surgery, and the medical sciences should precede concentrated study of the conditions and special human problems of health and disease which arise in industry. In industrial practice the medical man or woman will need to give detailed consideration to many matters which of necessity receive little, if any, attention in the already overloaded medical curriculum for qualification. Unless the would-be industrial medical officer takes advantage of the knowledge which is now available as a result of the experience and studies of others, he or she will have to acquire such knowledge and technique by experience at the expense of employees and of industry. This is the justification for proposing some form of post-graduate instruction.

"Preventive" is included because the efficiency and success of the industrial medical officer is directly proportional to the degree of fitness and standard of health he succeeds in maintaining in the population he serves, and inversely proportional to the size of his curative medical practice in industry. The industrial medical officer will best serve employees and employers by keeping men and women in an optimum state of fitness and freedom from disease and accident by taking endless pains to ensure that factors predisposing to unfitness or disease or accident are noticed, assessed, and promptly dealt with. The basic training for qualification enables the doctor to recognize disease, but the industrial medical officer must also be able to assess the degree of physical fitness of applicants and employees and their fitness for the particular work applied for, or on which they may be already engaged.

From our experience at the London School of Hygiene and Tropical Medicine and the contacts we have had with our past students, who, having taken the course for the Diploma in Public Health of London University, have proceeded to appointments wholly or partly connected with industry at home or abroad, I feel that the general teaching and practical instruction in the laboratory and the field now given by this School for the D.P.H. London and the Diploma in Tropical Medicine and Hygiene would, with some readjustment in respect of the allocation of time to certain subjects, admirably fit a medical man or woman for the industrial medical service.

Industrial Medicine in the D.P.H. London

I should like briefly to outline the course for the D.P.H., and to draw attention to the subjects which are of particular interest to industrial medical officers. To begin with, the course for the D.P.H. London is whole-time for one academic year, from October to July, or approximately nine months. It comprises teaching in the following subjects:

Bacteriology Applied to Public Health.—This course includes immunology, uses of antitoxins and sera; serological tests; the bacteriological examination of foodstuffs, air, dust, soil, and sewage; the bacteriology of animal diseases communicable to man; and the study of diseases due to moulds and yeasts, etc.

Chemistry and Physics in Relation to Public Health.—Under this heading such matters are dealt with as water supply and its purity; analysis of air and its impurities; analysis of foods and beverages, adulterants, preservatives, and chemical poisons; disinfectants, disinfestants; poisonous substances occurring in trade processes, etc.

Parasitology as Applied to Public Health.—Including entomology, helminthology, and protozoology.

The Theory and Practice of Public Health Administration and the Principles of Sanitary Law.—Comprising administration; social insurance; control of food; legal procedure concerning offensive trades; infectious diseases, factories, and workshops; public education in health, etc.

Sanitary Engineering.—Including building sites and site planning; building construction; reading of plans; drainage, sewage, and refuse disposal; sanitation of houses, factories, workshops, and dairies; sanitary administration; sanitation of ships, etc.

Epidemiology and Vital Statistics.—Compilation and analysis of medical statistical data; reports and forecasts and methods of conducting special investigations, etc.

Medical Industrial Psychology.—Labour wastage; sickness absenteeism and methods of investigation of such problems in industry, etc.

Physiology Applied to Hygiene and Industry.—Physiological requirements in relation to age, sex, occupation, and environment; family hygiene, budgets, food; physical education and tests for fitness in children and adults; physiological principles of heating and ventilation; recent advances in first-aid measures; factors influencing human efficiency and fatigue in industry; the physiological rationalization of industrial work, etc.

Throughout the course for the D.P.H. the attention of students is drawn to current literature—the publications of the Medical Research Council, the Industrial Health Research Board, and the various official reports of the Ministry of Health and the Home Office Factory Department. In addition to the subjects mentioned above, the course includes some forty visits to institutions, works and factories, dairies, food factories, offensive trades, special industrial processes, the Port of London, and numerous clinics. Special lectures are given on industrial hygiene and medicine by industrial medical officers and medical officers from the Home Office Factory Department, and several visits are paid to the Home Office Industrial Museum. During the session the students are also required to attend a course in district work involving a large number of attendances of not less than three hours each, and also a course on infectious diseases and hospital management provided by the London County Council.

This is only a brief outline, but I think it is clear that a very large part of the course for the D.P.H. London concerns matters of immediate interest and practical importance to industrial medical officers. No doubt some modification in the form of expansion in certain directions and cutting down in others would be necessary in order to provide more instruction in subjects of special significance to the industrial medical service, as, for example, the attendance at factory and works clinics for clinical and administrative instruction under experienced industrial medical officers in place of district work and possibly the course on infectious diseases. I think, however, that this post-graduate course, which has already proved its value to those entering the public health service, may usefully form a basis for discussion when considering the type and scope of training best calculated to fit medical men and women for the work and responsibilities which face the medical officer in industry.

Industrial Physiology

I have been asked to deal more especially with our work at the London School of Hygiene and Tropical Medicine in the field of industrial physiology, and as time does not permit me to go into details I propose to outline very briefly our approach to the subject and its scope. In doing so I wish it to be clearly understood that I do not consider the training we could give in the

*Paper read at the meeting of the Association of Industrial Medical Officers on October 30th, 1936.

Department of Industrial Physiology alone would be comprehensive enough for the medical man or woman preparing to enter the industrial medical service. In addition, it would obviously be necessary to include, for example, occupational diseases and disabilities, medical industrial psychology, medical statistics, health administration, and sanitary law.

In industrial physiology we try to direct and co-ordinate the thoughts of students in regard to the factors which influence the health, physical fitness, comfort, and efficiency of individuals and groups of individuals engaged in industrial work. You must forgive me if I state the case in a very elementary way, but I feel convinced that we must have in our minds some simple but fundamentally true physiological conception as a basis on which to build the superstructure of procedure, method, administration, and other measures concerned with the preservation of health and fitness.

At the outset we remind ourselves of that most interesting, and, I think, fundamentally true conception of life in the physiological sense which was put forward by Claude Bernard in 1878 in his book *Les Phénomènes de la Vie*, in which he wrote: "It is the constancy of the internal environment which is the condition of free and independent life. . . . All the vital mechanisms, however varied they may be, have only one object, that of preserving constant conditions of life in the internal environment." Physiological knowledge, which has accumulated as a result of research since Claude Bernard's time, serves to substantiate the truth of that conception. The importance and significance to physiological function of relative constancy inside the body in respect of temperature, osmotic pressure, hydrogen-ion concentration, blood sugar, calcium, chlorides, oxygen tension, and other physical and chemical characteristics of the blood and tissues is established, and we have to study the varied influences which tend to disturb that optimum internal state on which depends the individual's sense of well-being, health, comfort, physical fitness, efficiency, and working capacity.

It is clear that any material disturbance in one or more of these characteristics of the internal environment may find expression in the form of that intangible but none the less real phenomenon of life—"fatigue." Moreover, it is also apparent that attempts to find a universally applicable method of assessing fatigue by estimating the change in any single physiological characteristic are doomed to failure.

In seeking to make use of these fundamental conceptions in problems of health and comfort in everyday life and work it is useful to express the daily cycle of life in very simple terms—namely, activity, fatigue, recovery—and then proceed to analyse the physiological factors which determine equilibrium or balance in this cycle from day to day and working week to working week. Equilibrium in this cycle means that the optimum state of relative constancy in the internal environment is being maintained. The maintenance of equilibrium in this cycle, so that the recovery phase completely compensates for the state of fatigue occasioned by the activity phase, is the physiological problem before us. We must not, therefore, overlook any internal or external factor or group of factors influencing that equilibrium in any part of the body or in the body as a whole.

We can group the factors which are of physiological significance under the four headings, activity, environment, time, and individual, and draw up a plan or schedule into which may be fitted the various subjects which fall within the scope of industrial physiology. In the following schedule many subjects are listed, but all have some bearing on the equilibrium of the daily cycle of life—activity, fatigue, and recovery.

Schedule of Factors Influencing Daily Cycle

ACTIVITY → FATIGUE → RECOVERY

I. ACTIVITY FACTOR.—Mental / Muscular (static and dynamic components) { Light work / Moderately heavy / Heavy

II. ENVIRONMENT FACTOR.—Temperature. Humidity. Atmospheric Pressure. Air Movement. Air Change. Radiation. Noise. Vibration. Illumination. Atmospheric Pollution. Dust.

III. TIME FACTOR.—Duration of work per work spell; per day; per week; rate and rhythm of doing work.

IV. INDIVIDUAL FACTOR.—Individual make-up, physique, and state of fitness. Nutrition. Personal Hygiene. Economic Circumstances. Responsibilities. Family. Clothing. Home Environment.

All these subjects involve problems which need study, research, and application, some more some less according to the industry concerned and according to the individual or types of individual employed. If we have in our minds Claude Bernard's conception of the significance of constancy in the internal environment and have before us some such schedule as that outlined above, we are able to understand better the real nature of the problem of the preservation of the health and working capacity of industrial workers and the abolition of industrial fatigue, which I conceive to be the true objective of the Association of Industrial Medical Officers. To achieve that end most expeditiously and efficiently it is necessary that the medical men and women seeking whole-time or part-time service in industry should at least be armed with already available knowledge, and be trained in its application to special problems which arise in the practice of preventive medicine in industry. The provision of a course of post-graduate training on the lines indicated above would afford the necessary opportunity to those who feel attracted towards the promising field of medical service in industry.

In conclusion, I should like to add that I hope the day is not far distant when a comprehensive post-graduate course in preventive medicine in industry will be provided not only in London but elsewhere, and that those who take it and obtain a diploma or degree will thereby be fitted to become medical officers in a national industrial medical service or industrial health service on a par with the public health service, but with this difference, that both the State and industry collectively bear the burden. Such a service would include whole-time medical officers in particular industries and whole-time officers serving groups of works or industries which, in themselves, may be too small or too local for the whole-time employment of individual medical officers in each. In addition to medically qualified personnel it is not at all outside the bounds of practicability or common sense to suggest that physiologically minded engineers and physiologists, with interests in the application of medical science to the human problems of health in industry, might with advantage co-operate with or form part of such a service. The problems to be faced are many and varied and change with industrial progress and invention, and if man is to maintain his mastery over the machines the application of medical science in industry on a national scale should no longer be delayed.

The seventh annual meeting of the Federation of the Medical Scientific Societies of North Africa will be held in Algiers on March 22nd, 23rd, and 24th, 1937, the subject for study being "Typhus and Typhus-like Diseases." Reports will be made by Professor Burnet, director of the Pasteur Institute of Tunis, Dr. Blanc, director of the Pasteur Institute of Casablanca, Drs. Donatien and Lestoquard of the Pasteur Institute of Algiers, Dr. Gaud, director of the Public Health Service of the Morocco, Dr. Lemaire, director of the Public Health Board of Algiers, and Dr. Costantini of the Faculty of Medicine of Algiers. Additional notes and communications will be freely admitted. Special cheap tickets have been granted by French and North African railways, by the French lines between France and Algiers, and by Air France on seaplane trips between Marseilles and Algiers. Trips in Algeria will be arranged. Any medical men interested in this congress should apply to one or other of the general secretaries: Professor Senevet, Faculté de Médecine d'Alger, and Dr. Sarrouy, 47 bis, Rue d'Isly, Alger.

"THE DOCTOR'S MANDATE IN PARLIAMENT"

LECTURE BY SIR FRANCIS FREMANTLE

A Chadwick public lecture, entitled "The Doctor's Mandate in Parliament," was delivered by Sir Francis Fremantle, M.D., M.P., in the Great Hall of the British Medical Association House, London, on November 24th. Sir James Crichton-Browne presided. The lecture was an amplification of the Macalister Lecture delivered by Sir Francis Fremantle earlier in the year.[1]

Medical Parliamentarians of Former Days

The lecturer began by quoting from a "Medical Parliamentary Roll" compiled by Dr. Clippingdale and published in the *British Medical Journal* of January 8th, 1910, in which, and in subsequent letters, the names of eighty-four medical members of Parliament were recorded. According to Dr. Clippingdale the first medical Member of Parliament who could be so described with certainty was Richard Patrick, Member for Huntingdon in the first year of Queen Elizabeth, but the lecturer pointed out that he had overlooked the earlier name of Dr. John Somerset, physician to Henry VI, who sat in Parliament in the middle of the fifteenth century and was for six years Chancellor of the Exchequer.

Others mentioned in this old compilation were Dr. James, physician to the Queen's Household, in the Parliaments of 1584 and 1592; Dr. Samuel Turner, who served in the King's forces in the Civil War; Dr. Bathurst, physician to Oliver Cromwell; Sir William Petty, Dr. Quartermain, and Sir Charles Scarburgh, all physicians to Charles II; and Dr. Hutton, physician to William III; Nicholas Barbour, Honorary Fellow of the Royal College of Physicians, who was returned to Parliament in 1689; the great Radcliffe of Oxford, who sat in the three last Stuart Parliaments, and Dr. Dimsdale, who was sent by Jenner to St. Petersburg to inoculate the Russian Court against small-pox, and who sat for Hertford in 1790. A celebrated medical Parliamentarian in the nineteenth century was Joseph Hume, who was returned at nine elections between 1818 and 1852, and Thomas Wakley, founder and first editor of the *Lancet*, who sat for Finsbury in four Parliaments. Others distinguished in the last century included Sir Walter Foster (afterwards Lord Ilkeston), Sir George Pilkington, and Sir William Priestley in England; Sir Charles Cameron, Sir John Batty Tuke, and Dr. Farquharson for Scottish constituencies, and Sir Dominic Corrigan, Sir John Gray, Dr. Dillon, and Dr. Tanner for Irish.

"Every Member of Parliament," said the lecturer, "has a twofold duty, to his constituents and to Parliament, but he is sent to Parliament, again, with the double mandate for his contribution. If a genius is a man who knows something about everything and everything about something, so a doctor's mandate in Parliament is to express himself—and through himself the special experience of his profession and its knowledge of life in every phase and in every section of the community—both on matters of health and on those of general policy and administration."

Twentieth Century Health Legislation

On matters relating to health the doctor in Parliament had his great opportunity. At the beginning of this century the importance of the prevention or early treatment of disease in the individual was hardly recognized, but the Midwives Act, 1902, the Notification of Births Act, 1908, which was the basis of maternity and child welfare activities, and the introduction of the school medical service in 1907, and of national health insurance in 1911, were of first importance in this new direction. "These measures grew from the conscious experience of the people as represented in a democratic Parliament, and so they were adaptable and flexible, enduring, and alive with the vitality of spontaneous growth." The war, with its special needs, gave a great impetus to the new movements for national health. Out of it grew the Ministry of Health, largely due to Dr. Addison, the first Minister, and also the great housing movement, which had added over three million to the eight and a half million houses which existed before the war, and now, with the riddance of slums and overcrowding, bade fair to reach finality within a few years, and thereafter to need only steady vigilance and activity along normal lines.

Post-war legislation had developed the whole machinery of public health to a remarkable extent, throwing the burden and responsibility of its administration on local authorities, with generous expert and financial assistance from the Government. The lecturer reviewed the various Acts having a health significance which had been passed in each of the post-war years.

1919. Measures creating the Ministry of Health, and dealing with the registration of nurses and with housing.
1920. Measures concerned with dangerous drugs, national health and unemployment insurance, and war pensions.
1921. The Dentists Act and measures dealing with housing, tuberculosis, and public health officers.
1922. The amendment of the Unemployment Insurance Acts.
1923. The Dangerous Drugs and Poisons Act, a great housing measure, and a measure dealing with workmen's compensation.
1924. A further housing measure under the Labour Government.
1925. Measures dealing with dangerous drugs, the guardianship of infants, town planning, and an amendment of the Public Health Act.
1926. Acts dealing with the work of coroners, with births and deaths registration, with the registration of maternity homes, and with the sale of food.
1927. An amendment of the Mental Deficiency Act, and an enlargement of the previous measure with regard to maternity homes.
1928. Measures consolidating the Foods and Drugs (Adulteration) Acts, and amending the National Health Insurance Act.
1929. The Local Government Act, probably the greatest measure of the whole series, with its conversion of the Poor Law into Public Assistance under county councils and county borough councils, and the systematic rearrangement of local administration.
1930. The important Mental Treatment Act.
1931. Further measures dealing with rural housing and unemployment insurance.
1932. A Children and Young Persons Measure of great importance and other measures dealing with dangerous drugs and national health insurance.
1933. The Pharmacy and Poisons Act and other consolidating and amending measures.
1934. Measures dealing with water supplies and with compensation for coal miners.
1935. The great Housing Act, dealing with overcrowding and completing the general structure of legislation concerned with the housing problem.
1936. Consolidations of the Acts relating to old age pensions, national health insurance, and widows' and orphans' pensions; also the first of a great series of measures to consolidate the Public Health Acts.

As a result of the legislation of these years the law had been largely simplified by consolidation. Members of the auxiliary professions—dentists, nurses, midwives, and health visitors—had been recognized and helped.

A Great Health Era

The records of the twenty-five years' reign of King George V reflected the gains in communal health consequent upon the large amount of health legislation during the present century. Taking the number of deaths on an annual average during the ten years preceding George V's accession and comparing it with the figures for 1934, the deaths from diphtheria had diminished from just over 6,000 to just over 4,000; from diarrhoea and enteritis, from 18,000 to below 5,000; from enteric fevers, from 3,000 to 159; from measles, from 10,500 to below 4,000; from scarlet fever, from 3,600 to below 1,000; from pulmonary tuberculosis, from nearly 40,000 to 26,000; from other forms of tuberculosis, from just under 17,000 to 5,000; from whooping-cough, from 9,500 to 2,000; while deaths from small-pox had diminished from 400 to vanishing point. The general death rate during the same period had fallen by nearly 4 per thousand, and the infant mortality rate by 71 per thousand, and in the same quarter of a century the expectation of life had increased by some seven years.

[1] *British Medical Journal*, July 4th, p. 22.

Medical members of Parliament had not, of course, been the prime movers in the reforms which had resulted in so striking an improvement in the health picture of the nation, but they had played a considerable part in them. Before the war the profession had Lord Lister and Lord Ilkeston in the House of Lords, and in the House of Commons they had Sir Robert Finlay, Sir Michael Foster, Sir William Collins, Sir George Pollard, Dr. Chapple, and Dr. Addison, together with the Irish doctors. Since the war Lord Dawson, the late Lord Moynihan, and Lord Horder had made their mark in the Upper House, while three medical men—namely, Dr. Addison, Sir Auckland Geddes, and Mr. Walter Elliot, had risen to Cabinet rank and wielded high political influence. The universities had sent to the Commons Sir Watson Cheyne, Sir George Berry, Sir Robert Woods, Sir Sydney Russell-Wells, Sir Ernest Graham-Little, and Colonel T. Sinclair. Other medical M.P.s had included, amongst Unionists, Sir Richard Luce, Sir Henry Jackson, Sir Thomas Watts, Dr. Nathan Raw, and Dr. A. B. Howitt; amongst Liberals—Dr. Morris-Jones, Dr. Hunter, Colonel Beauchamp-Williams, and Sir John Collie; and in the Socialist and National Labour ranks—Dr. Salter, Mr. Somerville Hastings, Dr. Drummond Shiels, Dr. Haden Guest, and Sir John Worthington.

The Parliamentary Medical Committee

It was after the war that the Parliamentary Medical Committee was formed. Its first chairman was Sir Watson Cheyne, and its secretary, Dr. Farquharson, who was succeeded by Mr. Walter Elliot. Sir Francis Fremantle himself became chairman in 1922, and had so continued, save for the period of the two Labour Governments, when Labour chairmen were elected, respectively Dr. Haden Guest and Dr. Salter. At a Parliamentary Medical Committee dinner in 1924 Mr. Elliot and Dr. Salter, from opposite sides in politics, argued against the possibility of effective work owing to party divisions, but the rest of those present, a dozen or so, disagreed with them.

He proceeded to give some account of the activities of the committee. In 1925 it met representatives of the British Medical Association, the certifying factory surgeons, and medical officers of health with regard to a proposed Factory Bill—a measure which had not yet reached the Statute Book. In the same year it met the Anaesthetic Section of the Royal Society of Medicine on a suggested committee of inquiry into medical cases coming under inquest. In the following year it arranged a meeting open to all Members of Parliament, which was addressed by Lord Dawson on the relations of the General Medical Council to the profession and to the public. Since then matters had been taken up in connexion with the Opticians Bill, and, in fact, with nearly every measure already mentioned touching on health or social welfare. The committee had paid a visit to Aldershot to see the provision made for the health of the Army; also to various institutions connected with medical research and treatment. It had been addressed by representatives of the Health Organization of the League of Nations, the General Medical Council, and various medical bodies, and questions relating to lunacy, the sterilization of the unfit, and many other problems had come within its purview. It had, for certain defined objects, introduced many deputations to the Minister of Health, several to the Chancellor of the Exchequer, and occasional ones to other Ministers. It worked in close association with the British Medical Association, but independently of it, took an active interest in the principal measures before Parliament having health implications, kept in touch with officials, and heard evidence on various subjects. In the discussion following his lecture Sir Francis Fremantle was reminded of the help given by the committee in connexion with the Bill introduced by Captain Elliston last session for dealing with patent medicines. He said that the measure did not get on to the Statute Book, though it went a considerable way in that direction; it was a triumph to have obtained so large a measure of agreement among the various interests affected, and perhaps the Bill might be brought in again, first in the House of Lords and then in the Commons.

Before passing from this part of his subject the lecturer paid a tribute to several medical men no longer in Parliament who had, during their Parliamentary experience, assisted the committee, and he also mentioned the valuable services given by non-medical university Members, including Lord Conway, Sir Henry Craik, Mr. John Buchan (now Lord Tweedsmuir), together with several of those now in Parliament.

Party Politics and the Middle Path

In general policy and administration the medical Member of Parliament had no less important a part to play. There were many measures which at first glance did not appear to have any public health bearing, in which, nevertheless, the special experience and training of medical men were of value—for example, measures dealing with education, with questions of morality, as well as, each year, with taxation. No one could say that a sensible medical man was not able to make contributions of first value to the examination of such subjects. The doctor had a special knowledge of the conditions of the people and their mentality. He should know better than most the effect of Parliamentary action in the social sphere. He was trained in the correct method of dealing with a problem: the observation of facts, the diagnosis of causes, the prescription of treatment, the effective action, and finally, after-care or post-mortem examination.

"The medical man takes party for what it is worth, essential for practical purposes, but reflecting only tendencies between which he would naturally preserve the middle path of a liberal conservatism, with a full use of State machinery and resources on the one hand, and encouragement of private enterprise and initiative on the other. He sees the limitations of any policy, and in his mind has achieved a synthesis which is best expressed by an all-party Government; but he knows that such a placid system, without effective opposition, must in the end make for stagnation, and so he throws in his lot and influence on one side or the other of the central line. If he aims at high office he must avoid much occupation at first with health matters, or he will be 'damned as an expert.' By such avoidance he gains experience and credit, and may thus, in the end, be of the greatest service to the State."

On the medical man, said the lecturer in conclusion, fell the privilege of dealing fearlessly, in private and in public, with the "awkward topics"—sexual questions and marriage, betting, licensing, Sunday trading, and moral and religious problems. These subjects were instinct with pride, principle, and, in the proper sense of the word, with prejudice. The medical man, almost alone in Parliament, had no right to shirk the difficulty attaching to such subjects as birth control. His voice should be heard in deciding fundamental policy affecting peace and war, strikes and conciliation, as, indeed, any other matters—such as finance, education, and art—if he would take the trouble to study them and their background. The proper blending of material and spiritual values should be the dominant note of the doctor's mandate in Parliament.

E. Peluffo and E. E. Emeric (*Arch. de Pediat. del Uruguay*, May, 1936, p. 196), who record two illustrative cases in boys aged 6 years following diphtheria antitoxin, state that the first case of orcho-epididymitis due to serum was reported by Blechmann and Stiassnie in 1921, since when cases have been published by Carrieu, 1922, Goodall, 1925, and Gil, 1932, among others, but it is a very unusual manifestation of serum sickness. It generally appears ten to twelve days after injection of serum. One or both testes may be involved, sometimes the epididymis only and in others the testes only. Abdominal pain without any definite localization is an almost constant accompaniment. In every case on record complete anatomical and functional recovery has taken place and no testicular atrophy has ensued.

AIR RAID PRECAUTIONS

MEETING OF MEDICAL PEACE CAMPAIGN

A meeting convened by the Medical Peace Campaign (the British section of the International Medical Association for the Prevention of War) was held in the Hastings Hall of the British Medical Association House in London on November 25th. The meeting, which was poorly attended, suffered from a certain indefiniteness of objective, because two quite distinct issues were discussed—one the question of pacifism *versus* armament and collective security, and the other the efficacy of air raid precautions. After nearly three hours of speaking the following resolution was adopted by an attenuated audience: "That this meeting, called by the Medical Peace Campaign, while welcoming all practical measures taken by the Government, wishes to emphasize that no complete precaution against air attacks is possible, particularly in working-class areas, and that the prevention of war is the only sure measure of safety." It was also agreed to ask the Council of the British Medical Association to consider instituting an inquiry, similar to the inquiry into nutrition, into the value of anti-chemical warfare measures.

Dr. E. P. POULTON, who presided, said that medical men and women in the Campaign felt that in two directions the profession had a contribution to make, one on the psychological aspects of war, which did not concern the present meeting, and the other on the technical measures to protect the public from air attack. Dr. STELLA CHURCHILL stressed the importance of protective measures, and then came a series of speeches by experts.

The Engineer's View

Mr. MCKINNON WOOD, an aeronautical research engineer, said that the aircraft used in the last war, which caused 1,300 civilian deaths in this country and injuries to 3,000 people, were almost as different from the aircraft of to-day as Noah's Ark from a battleship. The modern aeroplane travelled at 300 miles an hour, had a striking range of 1,000 miles, and the biggest bombers carried from five to seven tons. Such a hostile aeroplane could get from the coast to London in less time than a defender could get to the same altitude. The methods used were likely to be explosive bombs, incendiary bombs, and poison gas. The most deadly weapon was the incendiary bomb, formed of combustible material and containing thermite, which could go through a thick plate of steel and some inches of concrete, and generated an enormous heat estimated at 5,000° C. An aeroplane with a ton of bombs could carry 1,000 of these, and if only one-fifth of them started fires in London it would defeat the fire brigade. Of the gases used the most likely was mustard gas or lewisite, and the thirty million gas masks to be issued to the civil population would be no more use against this than thirty million bowler hats. It was estimated that one hundred bombers, each carrying a ton, could poison an area forty miles square. Poison gas, however, was not likely to be delivered in a bomb, but sprinkled like rain.

An even more depressing picture was given by Mr. A. L. RAWLINGS, another engineer, who spoke of the ineffectiveness of sound locators for detecting the invading aeroplane, and the frequent failure of the searchlight on an aerial target. Until the machine was picked out by the searchlight there was practically nothing to be done, but once the searchlight was on the enemy the odds were against him.

A Medical View

Dr. F. R. EDBROOKE spoke as a medical officer of health. It was economically impracticable, he said, to give complete security; the population could not be protected against high explosives, and only with difficulty against fire. The difficulty of organizing the requisite body of first-aid personnel was also very great, and in addition there would have to be street wardens and rescue parties and much other organization. The only thing that could be done, while endeavouring to prevent the public from becoming war-minded, was to make the precautions as effective as possible, and to provide first-aid and hospital service, but to state frankly that the protection could never be complete.

Dr. J. R. MARRACK, professor of chemical pathology in the University of London, said that the outstanding problem was the case of the people who did not live under conditions which permitted them to set aside a gas-proof room. Some guidance as to the extent of this problem was afforded by the recent overcrowding survey, and the number of families overcrowded and living in houses marked down for slum clearance in one borough alone ran to 27,000. It was suggested that the second line of defence would be the gas mask, but the gas mask which, on the evidence of the illustrated papers, was being demonstrated to the people was not the civilian but the Army gas mask. It was quite understandable that gas masks for the civilian population had not been made, nor would it be advisable to issue them if they had been made; but surely the right thing to demonstrate to people was the gas mask they were going to have, and not some superior gas mask which they stood no chance of getting. Again, children under 5 could not wear gas masks, because the resistance to breathing was too great for the child to overcome. It was essential to create confidence among the people as to the methods which were being shaped to meet a possible gas attack, and he could not imagine anything less calculated to produce confidence than the combination of concealment and bluff which was practised by the spokesmen of the Home Office. When he heard what was said about respirators, gas-proof rooms, and evacuation of the population, he wondered whether those concerned had ever seen a slum or a baby. The British Medical Association had done a very good work in connexion with nutrition; if it would, as a non-official body, repeat the experiments with regard to measures of protection against gases it would do at least an equal service.

An M.P.'s Criticism

Sir FRANCIS FREMANTLE, M.P., added a few words on the general question. While claiming no special knowledge, he felt that more was being done behind the scenes than perhaps that critical audience realized. Another member of Parliament, Dr. ALFRED SALTER, declared that there was no protection against air raids except peace; and on peace—the removal of the causes of war—not on the mere saving of their skins or the skins of other people in case war broke out, their whole effort should be concentrated. "All these methods of so-called protection talked about by the Home Office and the War Office are perfectly fatuous, and the local authorities are being 'led up the garden.'" In Bermondsey, with a population of 110,000, he did not know of a single house that was likely to be made gas-proof. Reliable gas masks, according to one authority, cost over £5 each, and masks of comparable efficacy were not going to be supplied by the million to the general public.

In the course of further discussion some speakers were anxious to incorporate in the resolution a reference to the abolition of military air forces and the internationalizing of civil aircraft, but this was not agreed to, and even a reference to collective security was dropped.

E. Hammer (*Nederl. Tijdschr. v. Geneesk.*, September 5th, 1936, p. 3997) states that the number of patients admitted to the Binnen-Gasthuis, the principal hospital in Amsterdam, for peptic ulcer has considerably increased within the last twenty-five years, especially that of perforation of the stomach and fatal cases. This increase, however, only applies to males. A similar increase is shown by the statistics of deaths throughout Holland, but here again only in the case of males. Necropsies, on the other hand, show that the number of non-fatal gastric and duodenal ulcers and of scars in the gastric mucous membrane has not increased, and that the rise is only caused by severe cases in males.

LORD NUFFIELD'S GIFT TO OXFORD

ADMINISTRATIVE PROPOSALS

Lord Nuffield, as briefly stated in our last issue, has increased his munificent offer of £1,250,000 for medical research at Oxford to £2,000,000. This grand impromptu —for such it appeared to be—was made at a meeting of Congregation at Oxford on November 24th, held for the purpose of carrying a decree to set up the organization necessary for the establishment of the new school. Lord Nuffield had listened to expressions of gratitude from the Vice-Chancellor and from representatives of the city of Oxford, the staffs of the hospitals, and the Medical Faculty, and then rose and said that it was "a great pity if the scheme could not be completed as soon as possible," and that he was willing to give another three-quarters of a million—an announcement which created scenes of quite unacademic enthusiasm.

In a lengthy speech the Vice-Chancellor, Mr. A. D. LINDSAY, explained how it is proposed to give effect to what, in his own words, is "the most important thing that has happened in English Medicine for very many years." He first reminded Congregation that the present gift was the culmination of a policy whereby the Radcliffe Infirmary and the Oxford Medical School would be ever more closely associated. He mentioned, incidentally, that some ten years ago he was told by Dr. Abraham Flexner, who had done so much in the organization of medical research in America, that the next great step in medicine ought to be the foundation of an institute of clinical research, for which Oxford was the ideal place: it had a medical school, small and of very high quality, and medical graduates who all took the honours degree in physiology; it was also a city of the right size and of great tradition. The Vice-Chancellor next referred to Sir Farquhar Buzzard's presidential address to the British Medical Association, which was the immediate occasion of Lord Nuffield's offer. The University had endowments inadequate to the demands of modern research, as well as liabilities in other directions, and Lord Nuffield, in proposing to realize the Regius Professor's ambitious dream, had also relieved the University of the indirect financial strain which a munificent gift in one direction might entail in others. By his contribution of a further £100,000 to the appeal which the University was about to make, he had enabled it, without misgiving, to accept the larger gift.

Trustees and Committee of Management

The proposal which was placed before Congregation, and accepted with acclamation, was a decree, one clause of which looks forward to the framing of a statute in the future. The decree provides for a preliminary period when the new school of research will indeed be in existence but when the proper lines of its development will be in process of construction. After all, this is of the nature of an experiment, and it is better not to try to settle everything beforehand, but to set up machinery which will ensure the fair and equal co-operation of the chief parties concerned—namely, the University, the hospitals, and the Nuffield professors.

The machinery of co-operation is to consist of a body of trustees and a committee of management. The chief responsibility and power will lie with the committee, while it will be the duty of the trustees to see that the purposes and conditions of the scheme are observed. They will receive annual reports and accounts from the committee, and themselves report to the University. The trustees will include three representatives of the University, three of the hospitals, and three and a chairman appointed by Lord Nuffield. The first chairman is to be Mr. W. M. Goodenough, treasurer of the Radcliffe Infirmary and chairman of the Oxfordshire County Council. The committee will consist of three members appointed by the hospitals (with one member nominated by the honorary staffs), the Vice-Chancellor, the Regius Professor of Medicine, the Director of the Nuffield Institute, two members appointed by the board of the Faculty of Medicine, and the Nuffield professors.

The Nuffield Professors

The Nuffield professors—four at first—will hold (to quote the trust deed) the "senior posts to be held by men and women not subject to the distractions of private practice, under whose direction there are to be a body of salaried clinical assistants and house-officers selected for their promise of aptitude for the scientific investigation under institutional conditions of medical problems." The duties they are to perform in the hospitals will be under conditions agreed upon between the committee and the governing bodies. The independence of the hospitals is thus safeguarded in the difficult problem of fitting in the important work of these new research professors with the ordinary duties of the hospitals and the work and position of the honorary staffs. The Regius Professor of Medicine will play a special part in the development of the new experiment, with an onerous addition to his duties, and, as the Vice-Chancellor said, everyone will rejoice that this new experiment begins under the trusted and sagacious direction of Sir Farquhar Buzzard.

Only a small number of Oxford medical undergraduates —perhaps twenty each year—having special capacities and inclinations will carry through their clinical training at Oxford instead of in the London hospitals, but the Vice-Chancellor pointed out that no one could estimate the effect on the whole school of medicine and the men trained in it of the existence of a research school of this kind—surely a right and proper culmination of the great Honours Schools of Oxford.

The winter issue of *Oxford* (published for the Oxford Society by the University Press at 1s.) includes an article on Lord Nuffield's offer by Sir Farquhar Buzzard, who explains how preceding events and benefactions disclose a far-sighted policy which the donor has been pursuing over a number of years. "The fact that this offer has received such universal appreciation and approval indicates a widespread belief that it provides the means of creating a school of great value to the community at large. . . . Hence our great responsibility, the successful shouldering of which must largely depend on a determined, unselfish, and harmonious effort to answer an inspiring appeal for new light on the problems of the prevention and relief of human suffering. For that, in truth, is the unspoken but unmistakable challenge of Lord Nuffield's offer to Oxford."

THE BRITISH HEALTH RESORTS ASSOCIATION

The annual general meeting of the British Health Resorts Association was held on November 27th. Lord MESTON, who presided, referred feelingly to the recent death of Lieut.-Colonel R. H. Elliot, chairman of the association, and the man to whom the movement owed its inception. Colonel Elliot had helped the association continuously and generously from his private purse, and had shared in its work despite his precarious health. Lord Meston added that he had a special reason for gratitude in that Colonel Elliot had saved his eyesight and had given him in middle age a useful career instead of retirement into complete darkness, which he had thought was his lot.

Dr. ALFRED COX, the general secretary, referred to a correspondence that he had with Colonel Elliot only a short time before his death. He had told him that he did not know how the association would go on without Elliot's personality, to which he had replied: "What you say about the association must not be. I believe we have got over the

worst, and that the resorts are beginning to recognize that we have given them something they never had before and would now miss. The potentialities of our movement are great, and we have barely touched the fringe of what we might do with the help of our profession. It would be a poor compliment to me if the movement depended on me or on any other one man."

Dr. Cox said that the great achievement of the association had been to arouse the resorts to a sense of their opportunity. Some of them were beginning to extend their facilities for winter visitors. It was only recently recognized that an up-to-date resort with a climate such as obtained in the south and west of England should be independent of the weather by reason of modern scientific and architectural advances. He also referred to the handbook, *British Health Resorts*, which was gaining an ever greater acceptance. He felt that the association might well extend its work beyond the study of resorts to which people went temporarily to a consideration of different parts of the country as places of residence, from the point of view of soil and climate, for persons having, say, rheumatic tendencies, or persons suffering from the deterioration of increasing age.

During the year the Medical Advisory Committee had prepared a curriculum which it was hoped might eventually be used for the training of practitioners who wished to specialize at the health resorts. This country was practically the only one in Europe in which the science of climatology and hydrology had no academic or official recognition by any university or by the Ministry of Health. Finally, he referred to the one conference which had been held during the year—at Woodhall Spa in May—which was one of the most successful the association had ever arranged. But during the year the plan of "visitation" of the spas had been followed, and not only Woodhall Spa, but Strathpeffer and Bridge of Allan had been visited by persons specially qualified to report on the work which was being done there. The object of these visits was to be as helpful as possible to the spa visited, by bringing to bear the criticism of impartial persons who could compare one spa with another, and could, at the same time, verify and extend the information given in the handbook. Whether the work of the association went on would depend, not on a few medical men in London, but on the co-operation of the health resorts themselves, both seaside and inland, following upon the realization that something was being done for them which could be accomplished in no other way.

Dr. FORTESCUE FOX, the editor of the handbook, mentioned that in five or six countries the effect of climate in various conditions of health and disease was being studied, and yet in Great Britain, with several distinct climates around its coasts, the matter still awaited investigation. Thousands of children were placed in convalescent homes by rule-of-thumb arrangements, without any proper study of climate and situation.

In a general discussion several ideas were put forward for propaganda and for raising a larger income for the use of the association. The annual report of the council and the financial statement were adopted, Lord Meston was re-elected President, Sir Walter Langdon-Brown, Lord Horder, and Sir Stanley Woodwark were re-elected vice-presidents, and Sir Archibald Weigall was added to the number. The council of the association, a very large body, was also re-elected.

F. Le Doze (*Thèse de Paris*, 1936, No. 542), who records nineteen cases in women aged from 22 to 40, thirteen of which were fatal, states that tetanus is an infrequent complication of pregnancy and the puerperium, only 3.5 per cent. of all cases of tetanus occurring in this connexion. It is usually due to criminal abortion, but it may be a sequel of normal labour carried out in unfavourable conditions. In some instances it may be due to a wound unconnected with the genital tract. The incubation period is eight to eleven days on the average in favourable cases and shorter in the severe attacks with a rapid course. The best treatment consists in large doses of antitetanic serum and hypnotics accompanied by curetting and intra-uterine lavage. In cases of criminal abortion a prophylactic injection of antitetanic serum should be given followed by Ramon and Zoeller's formol toxoid (anatoxine).

Reports of Societies

INDUSTRY AND STATE MEDICINE

At the meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on November 27th, with Surgeon Rear-Admiral S. F. DUDLEY in the chair, a paper was read by Dr. LEONARD P. LOCKHART on industrial influences on the development of State medicine.

Industry, said Dr. Lockhart, must not be regarded as an unfortunate development in the social life of man, but rather as an expression in economic terms of the most remarkable manifestation of human activity the world has ever seen. It had potentialities for great harm, but at the same time it was man's most effective weapon in his struggle against natural forces. After some comments on industrial accidents and diseases and also on non-occupational sickness in which industrial factors also operated, he referred to the large, indefinite, and important group of cases which were either psychological to begin with or passed from an original physical to a continuing psychological state. In this sphere more than in any other the general practitioner and the industrial doctor were able to help one another. He instanced the manager whose lack of emotional balance upset his staff. This man might be primarily suffering from some physical ill, but the train of cardiac, gastric, and urinary symptoms which were engendered might easily mislead doctors who had to deal with them unless they had the clue which could only be supplied by the factory doctor when such an official existed. The strained back which failed to respond to treatment was often a compensation neurosis in need not of discipline but of understanding. Altogether the industrial factor in illness was one that transcended a simple classification into occupational and non-occupational. It would be absurd to suggest that only a biologist should have staff control; on the other hand, it was very necessary that as a part of general education a certain biological understanding should be inculcated. Widespread unemployment presented State medicine with some of its most devastating sequelae. It would take two generations to stamp out the harm in some of the distressed areas. The courts thirty years hence would be convicting people who were really the concern of State medicine on its psychological side, and whose troubles would be traceable to what was happening in South Wales to-day.

Industrial Medical Services

Between the insurance practitioner and the hospitals, and working in close co-operation with both, the industrial medical services were spreading. Wherever the worker could remain at work the factory clinic offered facilities otherwise difficult to obtain or non-existent. It often cost a man a day's pay to attend hospital for ten minutes' treatment. In skin conditions, minor sepsis, after-treatment of injuries, and sickness of all kinds, industrial medicine could do for the patient much that the busy private doctor could not do. The industrial medical service should be linked with management on the one side and education on the other. Every worker had an insurance doctor and every town a medical officer of health, and it was possible for each to know what the duties of the other were, but in industry it was different; medical services were by no means universal, or even common as yet, and where they existed there was great variety in the duties performed and the manner of performing them. Industrial medicine had distinct functions, and while, in co-operation with other doctors, treatment was one of them, its task was mainly advisory and specialist.

Medicine in industry was a function of management in any concern sufficiently alive to regard its staff as a biological unit. Efficiency hunting divorced from considerations of general health and well-being was responsible for some of the most difficult problems for the general practitioner, who had at present no link with industry except through the factory medical service where such existed. Dr. Lockhart considered it very desirable that

the school medical service all over the country should be enlarged, less on the lines of an inspectorate, and more in co-operation with the teaching staff. It was possible for young people to matriculate and yet to be physically illiterate, knowing nothing of that which would be their home, their economic capital, and their pleasure store for the whole of their lives. Apart from shortcomings in nutrition, many aspects of inadequate health at the present time might be but transient phases of readjustment. The altered relative economic positions of young and old, and of men and women, within the family, for example, might account for serious disorders with an emotional basis.

Dr. Lockhart concluded with some remarks on education. "Mankind needs an education which will enable rationalists to remain human and demagogues to become harmless." Education had too often been content to pursue exclusively utilitarian ends. If State medicine began to act as a ferment in the industrial thought of the time would it be effective? The answer depended on how deeply it studied the problem and how clearly it announced its conclusions. But so great was the present preoccupation with health, and so intense the feeling of insecurity, that any approach to the problem would undoubtedly evoke widespread interest and attention.

Breakdown Factors in Industrial Life

Professor MILLAIS CULPIN said that he estimated that from 5 to 7 per cent. of the population at work (not including hospital or clinic patients) were suffering badly enough from psychoneurotic symptoms to be in need of treatment, and outside these were a large number of cases of nervous disability which did not interfere to any great extent with happiness or efficiency. What the causes generally were it was hard to say. The more he saw of the conditions the less he was inclined to generalize. At first sight he might say that lack of economic security was the cause, but when it came to figures it was found that those occupations in which there was security had the highest sickness rate, while the lowest sickness was to be found in, for example, the laundry trade, where there was very little security. The reason was that with security there often went rigidity of occupational conditions which outweighed the advantage. When telegraphist's cramp was prevalent in this country it was almost unknown in the United States, for the reason, he believed, that telegraphists in the States had neither security or rigidity; they would think nothing of throwing up their job and going to another State, whereas the British telegraphist had to remain where he was. The same thing applied to miner's nystagmus, which he believed did not occur in America at all, and here cost £600,000 a year in compensation, one reason being that in this country "once a miner always a miner," whereas in America, at least before the slump, economic conditions were different, and it was quite possible for a miner at 40 to give up his job and turn to something different. He had asked a Japanese industrial doctor what were the chief disabilities among miners in Japan, and was told that they were ankylostomiasis and neurasthenia, and he supposed that in the neurasthenia any cases of nystagmus were included.

It might be expected (Professor Culpin continued) that in a modern factory with fresh air and hygiene, rest pauses, and good meals, there would be a low incidence of psychoneurotic sickness, but that did not follow. He had found one of the lowest sickness rates in a dirty laundry, while a works noted for its efficiency had a sickness rate about five times as high. Much was said about modern industry involving monotonous occupation, and it was concluded that monotony was likely to be the cause of nervous troubles, but of this he was not at all sure. It was not of monotony of work that people complained. Any number of people were content to carry on repetitive work. In his investigations into industry one of his frequent questions was, "Do you look forward to sticking at your job until the pension age of 65?" The girl of from 20 to 23 would laugh in his face; the woman of 30 would laugh not so readily; and at 40 the response was so painful that he gave up asking the question. The highest incidence of psychological breakdown in some industries was at the age of about 40, when people realized that they were tied down to their job for the rest of their lives. Much again was made of the factor of noise as a cause of nervous breakdown, but he was bound to say that taking individuals in a specifically noisy occupation and examining them one by one he had found them seldom complain of it.

Dr. E. STOLKIND and Dr. M. ROSENFIELD contributed some further points to the discussion, and the PRESIDENT, in thanking Dr. Lockhart, said that in the Navy they had much the same problem as in industry in regard to proneness to accident among youths before the neuromuscular system had become educated, just as there was proneness to disease until the reticulo-endothelial system was adapted. In the fighting services three doctors out of four spent a great amount of their time doing all they could to get certain men to tolerate their environment, but the anxiety neurosis due to misfits continued. As for psychology, a great deal of work by the psychologists had shown that a very large portion of the population was not educable beyond a certain point. It was more a question of how the very young—at the impressionable age—were brought up.

LYMPHADENOMA

At a meeting of the Section of Medicine of the Royal Society of Medicine on November 24th, with Sir CHARLTON BRISCOE in the chair, the subject of discussion was "The Aetiology and Diagnosis of Lymphadenoma."

Dr. MERVYN GORDON said that during recent years a systematic attempt had been made to define the causal agent of this condition. Negative results were obtained until search was made for evidence of a virus infection, when two new points came to light: (1) suspensions in broth of lymphatic glands from cases of lymphadenoma, when injected into a rabbit's brain, were found to produce a peculiar encephalitic syndrome characterized by rigidity, incoordination, and ataxia, accompanied by progressive loss of weight. As glands from other conditions failed to have this effect, the test formed a biological criterion of application for the diagnosis of lymphadenoma. It was not certain what factor was responsible for this reaction. Passage could not be obtained, and an agent possessing somewhat similar properties had been found by Friedemann in normal red marrow. (2) In the lymphatic glands of lymphadenoma cases elementary bodies closely resembling those present in other virus diseases could be detected in large numbers. A vaccine of these bodies after attenuation by heat was found by Dr. Gow to produce reactions in lymphadenoma cases even in small doses.

The object of Dr. Gordon's present communication was to report the results obtained since 1934. In the first place, the diagnostic value of the biological test had been confirmed by others, though its factors were still obscure. In the second place, in order to see whether these elementary bodies were the causal agent or not, the therapeutic value of a sensitized vaccine of them had been tried on a large number of cases of lymphadenoma, with special care as to preparation and dosage. He described the principle of a sensitized vaccine and the results that could be obtained from it in acute streptococal infection, and discussed the limits and conditions under which clinical improvement might be expected. At St. Bartholomew's there were only some twelve cases of Hodgkin's disease a year, but he had been receiving from all over the country glands from suspected cases of lymphadenoma to the total of about 300, and in the eighty-seven cases of lymphadenoma the biological test was positive in seventy-five and negative in twelve. With regard to the therapeutic value of the vaccine he showed temperature charts and other clinical records in cases of streptococal infection. The underlying argument was that if these elementary bodies from lymphadenoma glands were the causal agents, then, from the analogy of experiment in acute febrile infection, the sensitized vaccine should be capable of bringing about definite clinical improvement in suitable cases.

Vaccines and X Rays

Dr. E. C. WARNER said that on administration of the sensitized vaccine there was pyrexia, usually within from twelve to forty-eight hours of the injection; subsequently the temperature might fall to a lower level than before the injection, to rise again later. He mentioned four cases, in all of which the diagnosis had been confirmed by section and Gordon's biological test. No other treatment had been given except measures for the relief of symptoms and iron in anaemia. The first was the case of a young man who had had enlarged glands for many years. These improved under treatment, but he succumbed to miliary tuberculosis, though even at death the glands were smaller than they had been before. The next patient, aged 43, showed a marked subsidence of the glands. In the third patient, aged 27, the general condition was still poor, but the glands were progressively subsiding. The last case was a boy of 14 who had glandular swellings, and he, too, had shown marked improvement. Neither he nor Dr. Gordon regarded these results as in any way final. Attempts were being made to prepare a vaccine which would do better. It would take some years of observation to establish the fact of cure in any of these patients, but the results did suggest that it was a useful measure.

Dr. G. VILVANDRÉ said that the total number of such patients sent to the *x*-ray department of the London Hospital during the last five years had been 103—sixty-two males and forty-one females—of whom the youngest was aged 4 and the oldest 69, but the great majority were between the ages of 18 and 25. Enlargement of the glands of the neck was the commonest condition for which they were sent, but enlargements in the axillae and groin were not infrequent. A few applications of *x* rays might cause the disappearance of the enlargement, but the effect was only temporary. He could not say whether the reappearance after treatment was in the same or contiguous glands. With the help of radiographs he discussed the differential diagnosis, showing the appearance in Hodgkin's disease as compared with chronic lymphatic leukaemia, Mikulicz's disease, lung sarcoma, and the Schüller-Christian syndrome. Radiology, he said, could help a great deal in the investigation and diagnosis of lyphadenoma. *X*-ray therapy made the patient more comfortable, relieving what might be acute distress, but sooner or later—usually sooner—the disease returned and the patient died.

Dr. A. H. T. ROBB-SMITH, who had been assisting Dr. Gordon in the histological examination of the cases, said that one difficulty was in getting suitable glands. Often the dissection of the gland which had been sent to him was so close that no capsule was left, and the question of infiltration was left in doubt. In some cases definite leukaemic glands were sent up "query Hodgkin's." The main point which guided one in diagnosis was the complete destruction of the normal architecture in Hodgkin's disease and the fact of fibrosis, not only in the capsule, but spreading down through the trabeculae, which became very prominent. He and those working with him had always been most strict in saying that before a case was described as Hodgkin's disease it must be histologically characteristic. It was important until more was known about these various conditions—the interrelationship of which was possible, though not certain—to be very positive in cytological diagnosis, and when in doubt to indicate the doubt frankly.

Problem of Diagnosis

Professor DUNCAN WHITE, after describing a case treated by radiation therapy which had shown some improvement, said that he was a little sceptical of Dr. Warner's case of the youth who for years had had glands in the neck and ultimately died of miliary tuberculosis. One saw a number of cases with a provisional diagnosis of Hodgkin's disease and with symptoms of cervical adenopathy, intermittent pyrexia, loss of weight, and so forth, where the aetiological factor had been shown to be infection from a tooth. He would not accept the diagnosis of Hodgkin's disease unless it was definitely proved by biopsy. One clinical observation was that when there was widespread subcutaneous involvement of the glands it was relatively uncommon to find gross mediastinal adenopathy. It was also a very common thing for a patient to be suffering from gross enlargement of the mediastinal glands with only one or two of the cervical glands involved and on one side only. Dr. PHILIP ELLMAN confirmed Professor Duncan White's observation with regard to the mediastinal disease and subcutaneous involvement.

Dr. MERVYN GORDON, in reply, said that he hoped it would be possible to develop a serological technique enabling them to say whether or not the case was one of infection. The biological test in the rabbit, interesting as it was, was not of first importance. The real question was whether the elementary bodies in Hodgkin's disease were the causal agent or not, and for this purpose observations must be made on the human being. Some interesting observations had already been made confirming the view that the elementary bodies were involved in the causation, and if that was confirmed by wider experience it might be possible to introduce some therapeutic measure that would be useful. It was now known that the elementary bodies consisted of two antigens, one thermostabile and the other thermolabile, and the thermostabile element, on analogy, was the one that was causing the trouble to the patient, and the procedure was to make a neutralizing antibody.

TOXICOLOGY OF THE BARBITURATES

At a meeting of the Kensington Medical Society held at St. Mary Abbots Hospital on November 24th, with Dr. JAMES FENTON, the president, in the chair, Dr. E. ROCHE LYNCH, the Home Office pathologist, delivered an address on the toxicology of the barbiturates.

Dr. Roche Lynch said that the barbituric acid group of drugs were known as cyclic ureides, as opposed to the straight-chain ureides such as adalin, sedormid, and bromural, which were practically non-toxic. They were compounds of malonic acid with urea. Veronal, the first of these compounds to be used in medicine, was formed by replacing the two hydrogen atoms of the malonic acid by ethyl groups. By substituting other groups an almost endless number of these drugs could be produced. They were all soluble in water, but in different degrees, veronal being relatively easy to dissolve and luminal relatively difficult. The sodium salts were highly soluble and were therefore much more used in medicine—for example, veronal sodium, known as medinal. The margin between the toxic and the medicinal doses was small. Medicinal doses continually repeated might produce depression, visual hallucinations, delusions, and an ataxic gait resembling that of drunkenness. The drugs were quickly absorbed and were either decomposed or rapidly excreted in the urine. There was no cumulative effect, except that when the drug was taken continually the symptoms might persist for a time after it was withdrawn.

When a toxic dose was taken headache, vertigo, and ataxia would appear in a few minutes, and there might be a short period of excitement; the patient would fall asleep and then pass into coma. For a time the Babinski reflex might be positive, but afterwards all reflexes and sensations were abolished. Cyanosis was always present, and the breathing was stertorous and irregular, and in the later stages might stop for a time. The pupils were small, but would react to light for a long period. Temperature was subnormal and the pulse rapid. Retention of urine was common. The first catheter specimen should be preserved, for the analyst would find in it considerable quantities of the drug. The coma might last for several days, and at any time after the first twenty-four hours bronchopneumonia might set in; the temperature would rise to about 103° F. and the prognosis would then be less favourable.

Fatal Dosage

The barbiturates should be given with extreme caution to patients with defective renal function, chronic sepsis, hyperthyroidism, advanced heart disease, and impairment of liver function. The minimum fatal dosage was well

known for some of the older drugs, but not for the newer ones. Death had been caused by 15 grains of luminal and of veronal, 28 grains of dial, 10 c.cm. of somnifaine, and 6 grains of nembutal used for premedication in hyperthyroidism. The average fatal doses were larger, and, in the absence of modern treatment, 50 grains of veronal and 30 grains of luminal might be considered fatal. Willcox said that a repeated daily dose undoubtedly caused addiction, but that sudden discontinuance was not followed by severe symptoms. The chief signs at necropsy were bronchopneumonia with some parenchymatous and perhaps fatty change in the liver and kidneys. Such a finding, coupled with a history of coma, should suggest poisoning by a barbiturate. The incidence of poisoning with these drugs had been increasing until the present year, when a falling-off had been noticed, which might be due to the new Poisons Rules. Many of the cases were almost certainly accidental. The first two tablets might cause a stupor with failure of memory, so that the patient would think he had forgotten to take his dose and take another. This process might be repeated several times, and was probably the cause of a number of the deaths.

Dr. Roche Lynch strongly recommended the treatment of Willcox and Purves-Stewart. The stomach should be washed out with warm water, but no alkalis should be given, as they might combine with the drug to form a soluble salt, which was at once absorbed. Strong coffee and glucose should be left in the stomach, and the lavage should be repeated twice after intervals of about four hours. The colon should be washed out at once and after twelve hours. The patient should be kept warm, be catheterized, and, if necessary, be given oxygen. The head should be raised to avert bronchopneumonia. Lumbar puncture or, better still, cisternal puncture should be performed at once, and repeated every twelve or twenty-four hours until the coma was ending. The object of cerebro-spinal drainage was to relieve pressure and also to eliminate the drug, which was excreted into the fluid. Strychnine had been much used on the Continent, but had the disadvantage of introducing another poisonous substance and possibly another dangerous situation. Treatment by picrotoxin was under experiment, and alcohol had given promising results. If these were confirmed the treatment might be useful, for alcohol could not be regarded as a dangerous poison.

Blood Groups in Affiliation Cases

Dr. Roche Lynch then delivered a short address on the part which the agglutination tests for blood characteristics could play in the proof of non-paternity. He explained that the original four groups of Landsteiner—A, B, O, and AB—and the recently discovered characteristics M and N, were inherited regularly according to Mendelian laws. A child could not show a characteristic which was not in either of the parents, and it was therefore possible in an average of one in every three cases where a man was wrongly accused of being the father of a given child to say with absolute certainty that he was not the father, for the child would be shown to possess a characteristic which neither he nor the mother possessed. The test was an essentially negative one, and if it did not exonerate the man it could do no more than put him into a large class of men who might, so far as the test was concerned, have been the father. If the pathologist performing the test was reasonably competent and familiar with it there was no room for error. The great value of the method had been fully recognized on the Continent, where it was employed as a matter of routine in several countries. Many thousands of cases had been determined by its help, and it had proved as satisfactory as finger-print investigation. In the British Isles it was practically unknown, and the United States had also shown great reluctance to introduce it, but he understood that special legislation was being introduced into certain States to enable courts to order it to be performed. The reason why it was mistrusted in this country was partly because it was not well known, partly because it was still too expensive for the poor man, and partly because the common law principle of the sanctity of the person prevented it from being made compulsory. Dr. Roche Lynch advocated: first, that every woman who sought an affiliation order against a man should be obliged, on his application, to submit to the test as a condition of being allowed to proceed; secondly, that the test should be made available at the public expense for every defendant who wished to use it; and, thirdly, that the certificate of the pathologist instructed by the court to perform the test should be evidence of the result and that he need not be called as a witness.

BRITISH ORTHOPAEDIC ASSOCIATION

The annual meeting of the British Orthopaedic Association was held in London on October 30th and 31st, under the presidency of Mr. W. R. BRISTOW. On both mornings at the Royal Society of Medicine a series of short papers were presented.

Sciatic Scoliosis.—Mr. E. N. WARDLE (Liverpool) reviewed twenty-six patients in two groups—those without, and those with, deformity. The majority of patients were in the latter group. Mr. Wardle suggested that diminution in the height of the intervertebral disk between the fifth lumbar and first sacral vertebrae might be of importance in determining the occurrence of pressure on the lumbo-sacral cord. In all the patients complete relief had followed prolonged immobilization of the spine in a plaster jacket applied in suspension.

Protrusio Acetabuli.—Mr. JOHN GILMOUR (Newcastle) believed that protrusio acetabuli began in early adolescence, and almost exclusively in the female sex about the time of menstruation. He argued that softening of the Y-shaped cartilage due to some endocrine disturbance of ossification resulted in a giving way before the pressure of the femoral head, with consequent increase in depth of the socket. He considered the condition analogous to "slipped epiphysis"—separation of the upper femoral epiphysis in adolescence.

Arthrodesis in Tuberculous Arthritis.—Mr. H. J. SEDDON reported nineteen patients on whom an extra-articular arthrodesis had been performed for healed tuberculous arthritis of the hip. At first a tibial graft had been used, but the author expressed his preference for a broad, full-thickness iliac graft. Emphasis was laid on the advantages of operating through a large window in a previously applied plaster-of-Paris spica. Sound bony ankylosis had taken place in the large majority of patients, and excellent functional results following the procedure were demonstrated.

Culture Methods in Surgical Tuberculosis.—Dr. JOSEPH BAMFORTH outlined the manner in which a high percentage of positive cultures could be obtained on special media from fluids containing the tubercle bacilli—for example, pus, synovial fluid, etc. The method has the advantage of reliability, and the facilitation of early diagnosis for a statement one way or the other can be supplied in from two to three weeks after incubation.

Skin Defects Limiting Joint Movement.—Sir HAROLD GILLIES demonstrated many patients illustrating the advantages of different forms of skin grafts for contractures and skin defects around various joints. The resulting improvement in appearance and function was striking. Particular interest was aroused by the case of a patient suffering from generalized oedema of both lower extremities, with extensive skin ulceration. Fresh channels of lymph drainage had been established by grafting strips of skin from the arm to replace those taken from the lower abdomen and upper thigh—in this way opening up fresh communications between the lower limb and trunk lymphatic systems.

Chronic Backache.—Mr. J. S. BATCHELOR reviewed 116 patients falling in almost equal numbers into two groups—mechanical backache, due to faulty posture, etc.; and that due to fibrositis, acute and chronic, superficial and deep. Emphasis was laid on the frequency with which backache caused by mechanical strain is complicated by secondary fibrositis. Different regimes of treatment were advocated for each of the two groups. For the mechanical

strain repeated manipulation, without anaesthesia, followed by appropriate exercises, had proved more successful than routine manipulation under anaesthesia. Acute and subacute fibrositis demanded adequate rest and heat in the early stages, followed by graduated exercise and occasionally a manipulation under anaesthesia to restore mobility. A manipulation under anaesthesia was usually necessary as a preliminary in the treatment of chronic fibrositis. Relief of symptoms had been achieved in almost all of the patients suffering from mechanical strains and in about two-thirds of those suffering from fibrositis.

Oedema not Associated with Organic Disease.—Dr. A. A. OSMAN regarded this condition in the feet and ankles as a local manifestation of a generalized metabolic disturbance clinically associated with general debility. In all of his patients he had found a lowering of the alkali reserves (acidosis). Hence he believed that the oedema was due to gravity acting in the presence of a waterlogged "soil." The majority of his patients had been cured by appropriate periods of rest and the administration of large doses of alkalis, usually in the form of potassium citrate (up to 1,000 grains daily).

Method of Inserting Smith-Petersen Pin.—Mr. H. A. BRITTAIN (Norwich) described a consecutive series of twenty medical fractures of the neck of the femur. They had all been treated by internal fixation after reduction, with a Smith-Petersen nail introduced over a calibrated central guide through a half-inch incision, under *x*-ray control (see *Journal*, April 25th, 1936, p. 818). It was claimed that the three main difficulties—the reduction of the fracture; the placing of the nail correctly, both in the antero-posterior and lateral planes; and the selection of a nail of correct length—were more easily overcome by this method than by open procedure. Mr. Brittain suggested that it was wise to place the nail near the inferior and posterior margins of the femoral neck, since this minimized the risk of the nail breaking out of the capital fragment by adduction and external rotation of the limb—the position most frequently adopted by a patient resting in bed. There were three deaths—one from pulmonary embolus and two from causes unassociated with the injury. Of the remaining seventeen patients union of the fracture occurred in all except two.

Treatment of Fractures.—Mr. GEORGE PERKINS emphasized that a fracture was a dual injury—injury to the bone and injury to the soft parts. He made a strong plea that both should be treated concomitantly by encouraging active movement and use of those joints not immobilized by the necessary splintage from the very beginning.

Giant-Cell Tumours.—Mr. ROLAND BARNES (Manchester) presented a critical study of thirty-eight giant-cell tumours reviewed at the Memorial Hospital, New York. The best results in terms of non-recurrence and of joint function had been achieved by curettage and cauterization. Treatment by irradiation alone was not advisable, since it usually meant that histological proof of the nature of the tumour was lacking, that the cartilage of neighbouring joints was extensively damaged, and that recurrences were a little more frequent. Complete excision of the tumour was an excellent procedure, though with a very limited field of application. Amputation remained as the treatment of choice in neglected tumours in the upper end of the tibia or lower end of the femur.

On Friday afternoon a demonstration of operations and a large number of patients illustrating end-results were shown at St. Thomas's Hospital by Mr. C. MAX PAGE and Mr. GEORGE PERKINS. In the evening the association dinner was held at the Langham Hotel. Among the guests present were the President of the Royal College of Surgeons and Dr. Ralph Ghormley, secretary of the American Orthopaedic Association.

At the opening of the academic year Dr. Rafael Bullrich, professor of clinical medicine and dean of the medical school of Buenos Aires, illustrated the overcrowding of the profession by the fact that over 600 doctors qualified yearly in the Argentine Republic with a population of 12,000,000, and urged the need for stricter examinations for doctors and dentists.

Scotland

New Glasgow Professor

The Board of Curators of the St. Mungo (Notman) Chair of Pathology at the Royal Infirmary, Glasgow, has appointed Dr. J. W. S. Blacklock to succeed Professor John Shaw Dunn, who has been transferred to the chair of pathology at the Western Infirmary. Dr. Blacklock graduated M.B., Ch.B. with honours at Glasgow University in 1920, and took his M.D. in 1931. On graduation he received the Brunton memorial prize and the Bellahouston gold medal. After the war, in which he served as a surgeon sublieutenant in the R.N.V.R., and resident appointments in the Western and Royal Infirmaries, he took up pathology, being appointed assistant to Sir Robert Muir. In 1924 he became lecturer on pathological histology, and in 1928 Gardiner lecturer on the pathology of diseases of infancy and childhood at Glasgow University. He is also pathologist to the Royal Hospital for Sick Children, Glasgow.

Paying Beds at Edinburgh Royal Infirmary

At a meeting of the League of Subscribers to Edinburgh Royal Infirmary on November 25th, Lord Fleming said that the managers had considered the difficult question whether a charge might be made on patients in the institution, and counsel's opinion had also been sought. The Dean of Faculty had given the opinion that while the Royal Infirmary primarily existed for the poor and needy who were unable to pay for medical treatment in a hospital, the managers were entitled, if they thought fit, to charge a reasonable amount to a person who was in a position to pay for medical treatment. This opinion was, however, qualified, because the Dean of Faculty considered that there should be no fee-paying in the institution if any sick or needy person was seeking admittance, and there could only be fee-paying if there were beds available after all these persons had been provided for. Lord Fleming, continuing, said that the managers were not at present acting upon this advice, and no proposal had been submitted to the Board up to that date for charging for admission to the Royal Infirmary. It was pointed out that there had been complaints that members of the League of Subscribers who had failed to get admission to the Royal Infirmary were being charged fees when they received treatment in the municipal general hospital. Several courses were open to the league on this matter. They might press for free municipal hospitals, or they might await the results of negotiations between the Royal Infirmary and the town council. In Aberdeen, citizens transferred from the waiting list of Aberdeen Royal Infirmary were admitted free to the municipal hospital, and similar arrangements might possibly be made in Edinburgh. Another course was that part of the subscriptions paid by the league might be retained for the payment of fees charged to members treated in the municipal hospitals. This latter course would, however, involve additional expense in working the league, and it had been decided to take no action in this way. Still another possibility was to change the league into a hospital contributory association on the lines of the English schemes; this would necessitate the formation of a new association organized for the whole region served by the Royal Infirmary. The executive would prefer an arrangement that would continue the present close relationship with the Royal Infirmary and maintain free treatment in this institution. A statement of the league's accounts for the year to September 30th, 1936, showed that the contributions amounted to £27,581, of which £21,475 was raised in Edinburgh and £6,106 in country districts. This compared favourably with the contributions for the previous year, amounting to £24,572, and the executive anticipated a further increase of £3,000 in the coming year. The number of patients admitted to the Royal Infirmary during the past year was 20,675, of whom 11,000 came from areas outside Edinburgh.

England and Wales

Health of Bournemouth

Inquiries continue to reach the medical officer of health for Bournemouth concerning the outbreak of typhoid fever there last August, doctors and members of the public being still under the mistaken impression that it is not yet safe for visitors to go to Bournemouth. It is nearly two months since the last case was notified, and all those who contemplate visiting Bournemouth may now do so without any fear of infection. It was ascertained in the early stages of the outbreak that milk derived from a depot situated in Poole was associated with the cases. The Ministry of Health Medical Officer arranged that this milk should be pasteurized as from August 22nd, so that in the course of two or three weeks there was an appreciable effect. As reported in the *Journal* of September 12th (p. 545), the number of cases notified in Bournemouth itself up to the morning of September 4th was 222 ; the total number for the outbreak as a whole (excluding Poole and Christchurch) was 284 cases with thirty-one deaths.

Society of Apothecaries

A Yeomanry dinner of the Society of Apothecaries of London was held in the ancient hall at Blackfriars on November 24th, when the Master, Dr. Arthur P. Gibbons, with the support of the senior and junior wardens, Mr. Hugh Lett and Dr. Reginald W. Hayes, received a company of about a hundred. The guests included Sir John Herbert Parsons, president of the Royal Society of Medicine; Lieut.-General Sir James Hartigan, Director-General, Army Medical Services ; Surgeon Vice-Admiral Sir Basil Hall, Medical Director-General of the Navy ; Air Vice-Marshal A. W. Iredell, Director, Medical Services, Royal Air Force ; Sir George Chrystal, Secretary, Ministry of Health ; Sir Arthur MacNalty, Chief Medical Officer, Ministry of Health ; and the Deans of the Faculties of Medicine of the Universities of Oxford, London, and Sheffield, and of the Medical Schools of Charing Cross, Westminster, University College, King's College, St. Bartholomew's, St. George's, and St. Thomas's Hospitals, and the Provost of the Welsh National School of Medicine, with the Presidents of the Hunterian and Harveian Societies, the Dean of the British Post-Graduate Medical College, and the Head Master of Epsom College. Sir William Willcox introduced Sir Arthur Salusbury MacNalty, on whom the Master conferred the honorary freedom of the Society. Sir Arthur MacNalty referred briefly to his ties of friendship with the Society, and notably with the late Sir George Buchanan. The toast of " The Society of Apothecaries " was proposed by Sir Arthur Robinson, who concluded a brief and graceful speech by quoting one of the best-known licentiates of the Society—John Keats. Dr. Gibbons, in replying, pointed out that within the last twelve months, thanks to the generosity of the members of the Society, it had been possible to lay a new floor in the old hall. He quoted at length some references in the *Lancet* of 1827, in the index of which, under the heading of " Apothecaries," he noted: " Apothecaries, abominations of." The senior warden, Mr. Hugh Lett, proposed the toast of " The Guests," a toast which was replied to by Sir John Parsons and Mr. W. Girling Ball.

P. E. Rothman (*Journ. of Pediat.*, August, 1936, p. 167), who has collected seventeen cases of dysentery bacillaemia, including a personal one in a girl aged 2 years, states that there is a considerable amount of evidence to support the contention that the dysentery organism invades the blood stream more frequently than is generally believed. Many observers have obtained pure cultures of the bacteria from the heart blood, spleen, liver, or bile at the necropsy in patients who had died with bacillary dysentery. Positive cultures during life from the urine of male patients are presumptive evidence of a bacteriaemia if contamination through the faeces can be excluded.

CORRESPONDENCE

The Sherman Bigg Fund

SIR,—At the Representative Meeting at Oxford this year I met several members who were interested in the work of the Sherman Bigg Fund, which supplements the ordinary work of the Royal Medical Foundation of Epsom College by educational and other grants. I promised some of these inquirers that I would ask you to publish towards the end of the year a statement of the operation of the Fund. It will be seen that the income of Mr. Bigg's bequest has been almost quadrupled this year by donations from various sources. We cannot ever guarantee that recipients of educational grants will receive similar help in the future ; but there is a moral obligation to do so if funds permit. This means that unless we obtain at least as much help next year as we have had in 1936 we may have to discontinue some of the grants ; and unless we get increased help we shall not be able to take on many new cases. As several of my interlocutors at Oxford were Scottish members, they may be interested to know that (quite apart from pensions and foundationerships held by Scots) the Sherman Bigg Fund helped seven Scottish cases during 1936 at a cost of £152.

The council are anxious to augment not only the income but also the capital of the Sherman Bigg Fund and I appeal to medical men not to forget this when making or remaking their wills. During this year the number of estates left by medical men running to five figures each has been larger than I ever remember to have seen before ; but legacies have been far below our normal expectation.

The following is a brief statement of the Sherman Bigg Fund.

Epsom College, Sherman Bigg Fund

Income as at Nov. 30th, 1936	£	s.	d.	Expenditure up to Nov. 30th, 1936	£	s.	d.
Balance from 1935 account	1	2	7	Educational grants for 9 boys	173	0	0
Income from Investments	151	0	1	Educational grants for 9 girls	200	0	0
Grant from Medical Insurance Agency	200	0	0	Maintenance grants for 10 widows	105	5	0
Grant from Surrey Local Medical Committee	50	0	0	Invested to augment capital	89	13	0
Grant from B.M.A. (applied to capital)	50	0	0	Balance, capital uninvested	1	0	0
Private donations for capital purposes	40	13	0				
	90	13	0				
Private donations for income purposes	75	13	0				
Amount overspent	0	9	4				
	£568	18	0		£568	18	0

—I am, etc.,

HENRY ROBINSON,
Chairman of Council, Royal Medical Foundation of Epsom College.

49, Bedford Square, W.C.1, Nov. 27th.

Treatment of Carcinoma of the Cervix

SIR,—I have with much interest read in your last issue the letter of my friend and late house-surgeon Mr. J. W. Nankivell. I am in agreement with most of what he says, but (unless I misunderstand the purport of the remark) I am unwilling for it to be thought that my statement that carcinomatous glands are at present incurable by radiation was made with any intent of holding up radiological advance.

If those interested in the matter will study the paper entitled " The Results of Wertheim's Operation and a Comparison between Them and Those Obtainable at Present by Radium," which I read before the Obstetric Section of the Royal Society of Medicine in July, 1929,

they will see that I endeavoured to hold the scales fairly between the two, and that I showed, for cases in which the regional glands were free of cancer, that radiological treatment was more successful than surgical treatment. The invention of a radiological method by which carcinomatous glands on the side wall of the pelvis can be cured is much to be desired, and when it is achieved the results of pure radiological treatment will become incontestably better than those obtained by treating removable growths by surgery and irremovable growths by radiation.

In my opinion that method has not yet arrived, and those who argue that among the cases cured by radiation there must be some in which the regional glands are already involved are not supported by figures. Out of every hundred patients presenting themselves for radiological treatment on the average about forty already have carcinoma in their regional glands. Out of the hundred patients about five are too ill to be treated, and let it be assumed that in all of these the regional glands are carcinomatous. The remaining ninety-five patients, sixty of whom are "gland-free" and thirty-five "gland-involved," are submitted to treatment, it being impossible to say in any individual case whether the glands are involved or no. Supposing (to adjust the figure to rank among the best radiological results) that thirty five-year cures are obtained, this number is only one-half of the number of "gland-free" cases treated. If the curability of carcinomatous regional glands is to be conclusively proved by statistics it will be necessary to obtain over sixty five-year cures out of every hundred patients treated, and we are not within sight of such a cure rate.

My opinion is not, however, based on mere figures, but on actual experience. In my long series of Wertheim's operations I have had a good many in which, although the major part of the operation was completed, towards the close of it I discovered on the iliac vessels or in the obturator fossae carcinomatous glands or carcinomatous cellular tissue too adherent to be removed. There were besides a number of cases in which the state of the regional glands discovered on opening the abdomen forbade the operation altogether. The greater number of these cases were subsequently treated by *x* rays, which could be the more accurately directed because the exact position of the carcinomatous mass was known. I do not know of one of them that has been saved.

My experience is the same with massive recurrence on the side wall of the pelvis. This is the common form of recurrence with my patients, because in the great majority of them I remove all or nearly all of the vagina, so that there is little or nothing left there to recur in. Many of these recurrences have been treated by *x* rays, but not one of the patients has survived.

Whensoever a really successful method of radiologically treating carcinomatous regional glands is discovered the dramatic leap up of the cure rate will end all further argument.—I am, etc.,

London, W.1, Nov. 28th. VICTOR BONNEY, F.R.C.S.

Streptococcal Cervical Glands

SIR,—Mr. T. B. Layton (*Journal*, November 21st, p. 1052) invites me to argue on the treatment of streptococcal infection of the cervical glands by tonsillectomy. He condemns it for two reasons: first, that it does not prevent the infection or reinfection, and, secondly, that this infection is a good thing and should not be prevented. When matters got to this stage in a Socratic dialogue someone usually had the tact to change the subject.—I am, etc.,

London, W.1, Nov. 24th. DENIS BROWNE.

Treatment of Fractures

SIR,—In your issue of October 24th (p. 841) a letter appeared from Dr. Neil Douglas-Gordon which plainly stated that an outstanding fault in organizing the treatment of fractures is the practice, apparently common in hospitals, of relegating the initial treatment indiscriminately to the house-surgeon who happens to be on duty. I agree with this opinion, and it expresses the views I have held since I became interested in the subject a number of years ago, but it by no means follows that any reflection is cast thereby on the work or capacity of house-surgeons. I was surprised, therefore, to see that the cudgels were taken up on their behalf in a letter which appeared in the *Journal* of November 21st, which shows that this is evidently the interpretation put on it by Dr. Vaughan Eley.

The real position is surely quite clear. House-surgeons, unless specially trained for the purpose, cannot be expected to be thoroughly proficient in fracture treatment; they are apprentices, and when they have mastered their craft are naturally anxious to proceed to more remunerative work. The mere fact, therefore, that the primary reduction of fractures is left to them shows that this, the most important part of the treatment, is not regarded with the seriousness which it warrants. Furthermore, it is quite obvious that the best results will only be obtained when the initial treatment is carried out, or supervised, by the person who is to be responsible for the case throughout, and a fracture clinic which does not provide for this lacks one of the great advantages of organization.—I am, etc.,

Wakefield, Nov. 27th. D. H. RUSSELL.

Sedimentometers

SIR,—We must apologize if Dr. Garde (*Journal*, November 21st, p. 1056) thinks we have misquoted him in any way. We are aware that he always carries out the test in an incubator, in order to standardize the temperature, but in our own case (as also, we venture to think, in the case of other observers) it is essential to carry out the test in the manner that it is usually carried out elsewhere, in order that the results may be comparable. For this reason we have adopted the Westergren technique, in which the test is carried out at a room temperature of 18° C. A degree or so on either side of this does not seem to make an appreciable difference, but it is evident that gross deviations are to be avoided, and it was this point that we were raising in our letter. If Dr. Lee or Dr. Garde happen to be in this vicinity at any time we should be most pleased to see them and discuss the method with them.—We are, etc.,

J. W. SHACKLE, M.R.C.S., L.R.C.P.
C. L'ESTRANGE ORME, M.R.C.P.

British Red Cross Society's Clinic
for Rheumatism, N.W.1, Nov. 30th.

Impacted Wisdom Teeth: A Correction

SIR,—I should be grateful if you would allow me to correct an error which appeared in your issue of November 21st (p. 1044). In your otherwise accurate account of my dissertation on the aetiology of impaction of the mandibular third molar, which was delivered *ex tempore* in opening the discussion upon this subject at a meeting of the Medical Society of London, I am reported thus:

"He had collected radiographs of the molars in 500 students and 300 children, some of which showed how the third molar, even in the developmental stage, was thrown over, a condition which could not possibly arise unless there was an abnormal growth of bone."

It is true that I regard these cases as indicative of *under*-development of the lower face or snout, and therefore abnormal; but the impression which I wished to convey is that these skiagrams of children reveal cases in which the third molar at an early stage of formation is so acutely tilted, and so close to the posterior aspect of the second molar, that an abnormal speed-up of forward growth would be required for such a tooth to gain the necessary space in which to be able to rotate to the vertical and erupt completely into a normal functioning position.

This is the important factor to consider when estimating the advisability of resorting to my prophylactic operation of enucleating the follicle and its contents at this early stage.

The representative skiagrams of two children which I enclose show equal development of their wisdom teeth. In one, the tooth is acutely tilted and crowded behind the second molar. The probability is that this tooth will eventually become horizontally impacted. In the other skiagram the tooth, although slightly rotated inwards towards the tongue in the anthropoid manner, is not so acutely tilted, and, what is more important, has an abundance of space behind the second molar in which to complete its eruption. The former is abnormal and suitable for immediate enucleation, the latter is normal and should, of course, be left to continue its development undisturbed.—I am, etc.,

London, W.1, Nov. 24th. C. BOWDLER HENRY.

Bromide Intoxication

SIR,—The admirable article on bromide intoxication in the *Journal* of November 14th does not seem to have been comprehended as to the full implication of its facts and theories; and whether to congratulate the authors of this paper on their hardihood or their clinical acumen is a fine point.

The first and most obvious conclusion is that doctors do not know their business. Now medical men spend much time and trouble in learning a materia medica whereby they are supposed to acquire a knowledge of the action of drugs. That they ever acquire such a knowledge is improbable from the very nature of their academic studies and impossible under the conditions of clinical experience. It is true that they know a great deal about the actions of single drugs upon cats, mice, frogs, monkeys, gorillas, ducks; and how these drugs act upon lacerated portions of the anatomies of these unfortunate creatures. But when it comes to determining or knowing about the action of drugs upon men, whom doctors are supposed to treat and understand best, we find that the medical profession knows its business so badly that it takes the united efforts of three of them to point out to the remainder an elementary error which they habitually and universally practise!

I have said that doctors are ignorant of the true action of drugs upon the human body and do not know their business. Let me hasten to make a qualifying admission on this point. I have before me several works on materia medica, and especially one entitled *Allen's Encyclopedia of Pure Materia Medica*. This noble, if almost unknown, work shows 1877 as the year of publication, but it should be borne in mind that much of its material was gathered long before that date, and, indeed, the main facts might safely be reckoned as one hundred years old. It will at once be obvious to readers that such a monument of prescientific thought is not likely to hold much interest for them. Turn, however, to the article on kali bromatum, and there it will be found that this drug, when administered to human beings (names, dates, and place being duly supplied) caused, *inter alia*, the following symptoms to be observed:

Memory absolutely destroyed—amnesic aphasia—words repeated or misplaced—mentally dull—answers slowly—fearful apprehensive mood—hallucinations of sight and sound—with or without mania—delirium with delusions—weeping and profound melancholia—cannot recognize persons—slow speech—staggers as if drunk—stupor—fainting—drowsiness—coma—dilated pupils—eyeballs moving in all directions and not taking notice—vision dim—squint—anaesthesia of throat, mouth, and pharynx—pulse imperceptible, feeble, or intermitting—action of heart slow and fluttering—incoordination of muscles—paralysis of motion—skin eruptions of all varieties—sleepiness—sleeplessness—

and so on, with an account of symptoms running into several pages and verifying in every particular the symptomatology described in the paper on "Bromide Intoxication." If, as we are told, 5,000,000 insured persons receive bromides in a year in Great Britain it follows that of the total population some 15,000,000 (or about one-third) receive this dangerous drug in the same period, and at that from the hands of a body of professional men who know so little about the dangers of their job that they have even now to be instructed anew about facts discovered one hundred years ago. In the face of such ignorance, is it to be wondered that the Maudsley Hospital in one year admitted three medical men so poisoned that they were not only seriously ill, but in grave danger of being certified as insane?

It *is* true, as the authors point out, that the use of bromides results in a preventable quota of admissions to mental hospitals and much chronic ill-health. My own experience amply bears out these facts. Early in practice I found bromides to be dangerous in old people, and especially in arteriosclerotics, and often in small doses produced severe confusional states with hallucinations. Recently I was party to a ludicrous episode.

A young woman of my acquaintance fell ill with what looked like a functional nervous disorder. A physician thereupon diagnosed lethargic encephalitis. A consultant then saw the case, but could not agree with this terrifying opinion. The physician stood his ground, and prognosticated moral degeneracy, imbecility, or other mental aberration. Having given bromides for a considerable period, and a bromide acne having resulted, it was not long before the girl developed acute delirium with hallucinations. The physician at this point felt that the disease had progressed to the inevitable and triumphant conclusion which his rare acumen had foreseen. The consultant, recalled, could not find a sign of lethargic encephalitis, and said so, but neither did he find a sign of bromide poisoning. The girl, being then mercifully deprived of the drug, recovered, and has remained well since.

The statement that bromides are responsible for a preventable quota of admissions to mental hospitals and much chronic ill-health is damning enough against our profession; but when we consider that not only bromides, but many other drugs can, and do, lead to chronic ill-health also, the situation becomes deplorable. Drs. Barbour, Pilkington, and Sargant have shown the dangerous symptomatology resulting from the prolonged administration of bromides. This identical symptomatology exists in *Allen's Materia Medica*, and there is therefore so much reason to believe that this latter author is trustworthy. But when we turn up in Allen the symptomatology of the administration of iron, opium, arsenic, nux vomica, phosphorus, bismuth, iodine, iodides, sodium bicarbonate, magnesia, alumina, sulphur, belladonna, and many others which are in regular and prolonged use by physicians, we find innumerable pages of grisly facts showing that the use of these drugs is also followed by symptoms in all respects as alarming as these caused by bromides. If Allen is correct—and clinical experience shows that he is—the medical profession is only now

beginning to understand the enormity of administering drugs in crude doses to the human body.

Drug symptoms are the commonest result of the administration of medicines in this way, and physicians would do well to read *Allen's Materia Medica* and apply its drug pictures on the simple, effective, and at all times non-poisonous principles as laid down by Samuel Hahnemann.—I am, etc.,

THOMAS ROBERTSON, M.B.

Glasgow, Nov. 23rd.

Acute Rheumatic Meningitis

SIR,—The association between rheumatic meningitis and alcoholism, mentioned by Dr. Geoffrey Bourne in the account of his case in the *Journal* of November 21st (p. 1017), is an interesting one. I would certainly agree that the symptoms were not due to delirium tremens—the three weeks interval is far too long, seventy-two hours being the average. Recent experimental work, however, by Katzenelbogen,[1] Fleming and Stotz,[2] and Bogen[3] does show that it is not uncommon to find in chronic alcoholism an increased barrier permeability between the blood and the cerebro-spinal fluid, thus causing a ready passage of toxic substances into the cerebro-spinal fluid. If the passage of the rheumatic toxin were thus facilitated, the meningeal reaction described could follow. During five years as medical superintendent in an institution for the treatment of alcoholism I saw no cases of acute rheumatism, and think that the association is uncommon.—I am, etc.,

H. K. V. SOLTAU.

Bath, Nov. 24th.

An Unusual Vesical Calculus

SIR,—The particulars of the following case may be interesting in view of Captain R. D. MacRae's description of an unusual vesical calculus (*Journal*, November 7th, p. 921).

In March, 1932, a multipara was admitted to the hospital of the Women's Christian Medical College, Ludhiana, Punjab. Her only symptom was abdominal pain increasing on defaecation. Examination showed a retroverted uterus with adhesions between it and the rectum. At the laparotomy, which was performed with the intention of breaking down adhesions and performing a Gillian's suspension, a pointed stick was found in the pelvic colon, to which was attached what was at first supposed to be a tumour with a narrow neck joining it to the colon. An incision was made at the neck, and the handle of what appeared to be a bone crochet-hook was extracted from the colon, which was sewn up. It was then discovered that the mass from which the bone handle projected was the bladder. On opening the bladder a large calculus was found with the bone handle projecting from it, looking extraordinarily like a child's toffee-apple.

In view of the fact that the indigenous or untrained midwife with no knowledge of anatomy and with proverbially bad eyesight still holds sway in many parts of India, it is easy to see that the occasional cases of urinary calculi secondary to bits of stick, tow, etc., are due to attempts at abortion, the urethral meatus being mistaken for the external os. The interest in the present case lies in the fact that the pointed end of the instrument inserted should have pierced the bladder and the pelvic colon and yet have caused little discomfort. Apart from slight fever the patient made an uneventful and complete recovery.—I am, etc.,

MARJORIE V. N. SUDDS, M.B., B.S., D.T.M. and H.

Royal Free Hospital, Nov. 24th.

[1] Katzenelbogen: *The Cerebro-spinal Fluid and its Relation to Blood*, 1935.
[2] Fleming and Stotz: *Arch. Neurol. and Psychiatry*, January, 1936.
[3] Bogen: *California and Western Med.*, April, 1936.

Blood Transfusion

SIR,—In the very interesting article of Mr. P. L. Oliver (*Journal*, November 21st, p. 1032) on a national blood transfusion service, he refers to the blood groups by the Moss nomenclature, which, I believe, is still in general use in hospitals and medical practice in this country. Surely, instead of Group I (Moss), AB is simpler to write, and at the same time avoids the possibility of confusion with the Jansky system. In anthropology, where blood grouping is of increasing significance, and by serologists also, the terms O, A, B, and AB were officially adopted, and are now, I think, in almost universal use. Those who employ this simple system find it confusing to have to remember that Group I is AB under the Moss system, but O in the Jansky system. The terms M and N are already in medical use for other blood differences. Cannot the medical profession be persuaded to adopt the simple terms O, A, B, and AB as well, thus falling into line with international practice and avoiding a source of confusion?—I am, etc.,

R. RUGGLES GATES,
Secretary, British Association Committee for Blood Grouping Primitive Peoples.

London, W.C.1, Nov. 26th.

Safe Catgut

SIR,—The leading article published in your issue of September 26th and subsequent letters relative to the memorandum published by the Ministry of Health are of particular interest to all who are in any way responsible for the supply of surgical catgut for operations. In view, however, of the evidence which the Ministry of Health adduced definitely unfavourable to "home-cured" catgut, it is surprising to find anyone advocating its use. There must be risks, either by contamination or by ineffective sterilization, in "home-cured" catgut which are not present in catgut prepared under licence from the Ministry of Health, packed in the orthodox fashion for immediate use, and requiring no further sterilization in the theatres. This is the only type of catgut which we have used at this hospital for some years past.—I am, etc.,

ARTHUR G. ELLIOTT,
House Governor.

London Hospital, E.1, Nov. 17th.

Shoulder Dislocation During Sleep

SIR,—Dr. A. H. Newton's letter (*Journal*, November 28th, p. 1117) recalls a case I saw four years ago with somewhat similar features. An electrical engineer, aged 20, awakened at 5 a.m. one Sunday with severe pain in the right shoulder and loss of use of the arm. The previous evening had been quietly spent with his parents, and he retired at 11 p.m. feeling perfectly fit. There was no history of any previous shoulder injury. On examination in bed I found he had a total subglenoid dislocation which I was able to reduce by the extension method without difficulty. There has been no subsequent trouble with the shoulder.

Three years previously he had been under my care with a fracture of the base of the skull, but was able to resume work ten months later. On two subsequent occasions when driving a car he had lost consciousness, but had not been involved in an accident, as he was just able to pull in to the side of the road before collapsing over the steering wheel. He had been admitted to local hospitals with a diagnosis of epilepsy, and his driving licence was withdrawn on representations from the police. He had been taking luminal daily since his head injury, and there was no other history of fits. He was later operated on by Mr. Hugh Cairns, who removed a small detached spicule from the region of the petrous portion of the temporal bone, and he has remained well and at work

for the last two years. A Jacksonian fit, nocturnal and of considerable violence, would appear to be the explanation of the shoulder dislocation.—I am, etc.,

Douglas J. B. Wilson, M.B., Ch.B.

High Wycombe, Nov. 29th.

Sir,—Dr. A. H. Newton's letter in the *Journal* of November 28th (p. 1117) reminds me of the condition of my left shoulder-joint, which led to some quite laughable —if painful—occurrences.

Several severe strains affected a joint which probably had been rendered rather more slack than normal by the overdoing of "dislocation" exercises in the gymnasium. At one time the head of the humerus used to slip almost over the edge of the glenoid fossa with a painful "crunch" at almost any time that I made an unguarded movement with relaxed muscles. As a rule I could almost always prevent complete dislocation by bringing the arm sharply across my chest as in the last movement of one method of reduction; this became a reflex action.

I once awoke with my arm stretched above my head—quite immovable. Being half asleep I hardly realized the position, and merely put up my right hand to my left and pulled down and across my body. The usual "crunch" occurred, but was much more painful than usual, and I awoke properly with a yell that startled my wife! Except that I do not think that the dislocation can have been quite complete, the same thing had happened on our honeymoon, and nearly scared my wife out of her wits; being during short leave from France she thought that I must have bad "shell-shock."

On another occasion, while driving a car, I experienced the double shock of having my shoulder dislocated and "reduced" again in a few seconds. One of the front wheels struck a boulder, causing the steering wheel to spin violently anti-clockwise; this put the joint out; the compensating clockwise spin put it in again! I drove on feeling rather dazed.

A few years ago I contracted severe inflammation of the left hand and septicaemia. The enforced rest and subsequent contractures have cured the tendency to sub-luxation—but I would rather have had the old arm as it was.—I am, etc.,

Coldingham, Berwickshire, Nov. 29th. F. O. Taylor.

Voluntary Euthanasia

Sir,—In his letter published last week (p. 1116) Dr. Redmond Roche reminds us that many voices other than those of doctors have a right of audience in the discussion on voluntary euthanasia. Among these, very properly, are those which represent clerical authority or opinion. Yet one of the arguments presented from this source is likely, if accepted, to have an embarrassing effect on some of the activities of those who practise the profession of medicine. The position is stated in this fashion: the Church recognizes the ethical value of pain; where, however, pain exists together with the prospect of early death it can have no ethical value; hence to suppress it is justifiable, even though the suppression of the pain requires also the suppression of the patient. The thesis, if the premisses be accepted, seems a sound one. But to it there is an unavoidable sequence—namely, that to relieve pain which is not associated with impending death, and which therefore carries ethical benefits, is to inflict a moral mischief on the sufferer. How, then, can the medical profession be justified in prescribing hot-water bottles, soothing poultices, and sedative drugs, seeing that these agents are calculated to neutralize an ethical discipline which, but for their operation, might well have produced a character adorned by graces hitherto existent only as latent possibilities? To distinguish between pain having ethical value and pain possessing no such guarantee is a new demand on medical judgement. In any event it is manifest that to destroy such values, where they are admitted, is an offence against the moral code and an injustice to the true interests of the patient; and the becoming advice in such circumstances is not that the pain should be relieved but that it should be endured. A defence of voluntary euthanasia by an argument which carries this conclusion may perhaps succeed from the pulpit, but will hardly be popular in the consulting room. —I am, etc.,

London, W., Nov. 30th. C. O. Hawthorne.

Treatment of Pink Disease

Sir,—A few years ago I treated a case of pink disease with a course of ultra-violet light. The symptoms improved, the child became less fretful, and an uninterrupted recovery followed. This letter does not justify dogmatism, but is written by way of agreement with Dr. Rich's letter in your issue of November 28th (p. 1117).—I am, etc.,

Coventry, Nov. 28th. Arthur H. Laird.

Individual Protection for Retired Practitioners

Sir,—In the early part of this year the London and Counties Medical Protection Society considered the question of extending the benefits of the society to practitioners who had retired from practice and who had been members for several years. At the annual general meeting of the society on May 6th certain alterations in our Articles of Association were confirmed, thus enabling the society to elect as honorary life members such practitioners who have retired from practice after having been members of the society for thirty years; this without further subscription. By a further alteration in our Articles power was given to the Council to grant additional benefits or special indemnity on such terms and in return for such extra payment or subscription as the Council may from time to time prescribe. We have already elected several honorary life members who have been members of the society for thirty years at the time of their retirement from practice.

At the same time alterations in our Articles were made to allow of our undertaking a case brought against a deceased member's estate provided that the cause of action arose during the time of his membership.

We have under consideration an extension of our benefits to members by a somewhat similar scheme to that adopted by the Medical Defence Union, whereby members can retain the benefits of membership after retiring from practice, having been members of the society for a less period than thirty years, by paying an additional inclusive subscription.

I might add that although our Articles of Association have so recently been altered we have already had a case where an action has been brought against a deceased member's estate which we have defended.—I am, etc.,

C. M. Fegen,
Secretary.

London, W.C.2, Nov. 28th.

Addendum to the "British Pharmacopoeia"

Sir,—In your annotation of October 3rd (p. 685) it is mentioned that the Pharmacopoeia Commission proposes to publish an addendum to the *British Pharmacopoeia* in 1936, and that it will be available to the public on December 29th, 1936. But for the benefit of those who may be interested advance copies are available for inspection at the offices of the Council in London, Edinburgh, and Dublin under certain conditions. It is to be regretted that no such arrangement has been made in India for persons interested to consult this book prior to its publica-

tion, which implies that the book will not be available in this country before the end of January, 1937.

Now that the Medical Council of India is fully established is it not possible to send advance copies to the secretary to enable persons interested to consult the book earlier? On previous occasions I have noticed that books on materia medica and pharmacology, revised according to the new *British Pharmacopoeia*, have been published almost simultaneously with the publication of the *Pharmacopoeia* itself. This could only be possible when the persons interested in the subject had access to advance copies prior to publication. Can nothing be done to alter this anomalous position?—I am, etc.,

B. N. GHOSH,
F.R.F.P.S.Glas., L.M.Dub.
Professor of Pharmacology, Carmichael Medical College, Calcutta.

November 18th.

Medical and Dental Inspections of School Children

SIR,—In the *Times* of November 19th there is a letter from Mrs. Lowe, chairman of the Educational Committee of the London County Council and my colleague on the Court of the University of London. The second paragraph of this letter raises questions of interest and importance to the medical and dental professions and perhaps also to the school child.

Mrs. Lowe expresses "astonishment" at the suggestion "that six inspections by a dentist (*using a probe and mirror*) during the course of a child's school life, supplemented by four inspections by a doctor (*without probe and mirror*) are as effective, from the point of view of conservative dentistry and the preservation of the teeth of the children, as eight examinations by a dentist and two by a doctor [the position now enforced by the present majority of the L.C.C.] or as ten inspections by a dentist, which will be achieved next year."

It will be noted that the number of professional inspections of the school child is the same under former and present regulations. Mrs. Lowe apparently thinks it is a self-evident proposition that eight examinations by a dentist and two by a doctor is a better method to secure the preservation of the teeth of the children than six inspections by a dentist and four by a doctor. Mrs. Lowe vouchsafes no reasons for her opinion, and it would be interesting to know them. The importance ascribed to what may be called "general medical factors" in the growth and preservation of teeth has become so greatly widened as a result of recent research that it would be at least arguable that a proportion of four medical inspections against six dental inspections is a wiser distribution of effort than the reduced medical proportion which Mrs. Lowe favours.

It is difficult to understand why the humble probe and mirror should be invested with such a halo of sanctity by Mrs. Lowe and why she should be so positive in her assertion (in the sentences of her letter which I have italicized) that the doctor's examination is made without a probe and mirror, the dentist's with—unless, indeed, the Education Committee of the London County Council makes the use of probe and mirror compulsory for the dentist and withholds it from the doctor.

The matter assumes a deeper significance, however, from Mrs. Lowe's statement, if I understand it aright, that medical inspections after next year will no longer be made, and ten dental inspections will replace the present mixed medical and dental examinations. Is this modification partly dictated by a mistaken motive of economy? A doctor's professional training is at least one-third longer than a dentist's, the expense of carrying on his work is considerably greater, his responsibility on the whole heavier. Medical fees consequently are as a rule higher than dental fees. Unless the London County Council reverses this usual relation the present regulations, and still more the future regulations foreshadowed, would indeed save money for the Council, but I submit would not on balance be beneficial to the school child.—I am, etc.,

E. GRAHAM-LITTLE.

London, W.1, Nov. 24th.

Hospital Policy and Organization

SIR,—Dr. Turrell, in his excellent paper published in your issue of November 21st (p. 1022), has rightly given first place to technical measures, and has also devoted considerable space to the importance of a correct policy. It seems that there are four things to be taken into account for work in clinics and hospital out-patient departments.

1. Technical knowledge and equipment.
2. The aim we have in view. The application of this knowledge and equipment to the patient. This is our justification for being there at all and is what the patient needs.
3. A policy to provide facilities for applying technical measures. The framing of a policy is the business of lay as well as of medical people. The touchstone of a correct policy is whether adequate facilities for achieving our aim are provided. Policy is often conditioned by environment, opportunity, and finance—according to circumstances it can be changed or amended.
4. Organization—that is, arrangements to avoid waste in the actual carrying out of work. Waste can be of time, energy, or material.

In a factory there is systematic investigation into the details of manufacture, and the various "costings" incurred, and also into the results achieved. Consider if the light of publicity were thrown on various parts of medical work, should we feel quite complacent? Think of the hours the poor spend in some hospital out-patient departments simply waiting. Would Lord Nuffield or Mr. Ford tolerate gross waste of time, power, and material in their factories? To lessen avoidable burdens and to minimize unnecessary discomforts should be considered part of our work.—I am, etc.,

A. R. FRIEL, M.D.

London, N.6, Nov. 24th.

The Earliest Sanatoria in England

SIR,—With reference to Dr. Claude Chidell's letter (*Journal*, November 7th, p. 950), I believe that the Royal National Sanatorium, Bournemouth, has an indisputable claim to be the first sanatorium in England, having been founded in 1855 by some friends of Brompton Hospital, but mainly upon the initiative and with the financial assistance of the late Mr. Charles Lavington Pannel, at that time a member of the Brompton Hospital Committee of Management.

Among several sites considered by the founders Bournemouth was chosen on account of its "possessing in a high degree the three great requisites of a healthy situation—dryness, equability, and mildness of temperature." Sir James Clarke, Physician in Ordinary to Queen Victoria, remarked: "From an attentive consideration of its position, its soil, and the configuration and character of the surrounding country there could be no doubt that Bournemouth deserves a place among our best climates."

The Royal National Sanatorium was opened on October 1st, 1855, with accommodation for thirty patients. Since then several extensions and improvements have been made, new equipment and appliances provided for the modern treatment of pulmonary tuberculosis, and the number of beds increased to ninety-five.—I am, etc.,

D. A. HUTCHESON, M.D., D.P.H.,
Medical Superintendent, Royal National Sanatorium.

Bournemouth, Nov. 24th.

Obituary

ERNEST ALFRED ELKINGTON, M.B., M.R.C.S.

Newport, Shropshire

Many members of the medical profession, as well as his patients whom he served so faithfully, will regret the passing of Ernest Alfred Elkington, on November 17th, at the advanced age of 87. He had lived a great many years in the town of Newport, Shropshire, where he was held in the highest esteem, not only because of his skill in his profession, but also because of his sterling character. His many friends will feel his death as a personal loss in a very real sense.

Born in December, 1848, Dr. Elkington came of an old medical family. He was the younger son of Dr. G. Elkington of Edgbaston, Birmingham, and his father and grandfather were medical practitioners in that city. Educated at King Edward's School, he afterwards took his medical training at Mason's College, Birmingham, of which in 1897 he became an Associate. He took the M.B. of London University in 1871 and had the distinction of being the first student of a provincial medical school to win the gold medal and scholarship in anatomy. He also obtained the gold medal in forensic medicine in the Final Examination. He gained the M.R.C.S.Eng. and L.S.A. in the same year. After qualifying, Dr. Elkington went to Edinburgh University, where he came under the influence of Lord Lister. The two formed a close friendship. He later continued his studies in Paris during the eventful period which followed the Franco-Prussian War of 1871–2.

He began practice in Newport in 1872 and retired in 1932. Despite the exigencies of a large and growing practice, Dr. Elkington found time to take an active interest in the affairs of the town of his adoption, and by his energy and sound business acumen he made his presence felt in many directions. Advancing years quite failed to subdue the engrossing interest he displayed in many institutions which had the good government of Newport as their aim, and it was only on his retirement from practice that he allowed himself any respite. He was a member of many public bodies, including the urban council, and he will long be remembered for the part he played in forcing that body to adopt, in the teeth of the most intense opposition, the water and sewerage schemes, which have been of untold benefit to the town, and, in the case of water, to the adjoining parishes. His views on the subject were ahead of his time, but he joined issue with those who opposed his schemes, and his critics were silenced by the force of his argument and by his transparent sincerity. It was fitting that it should have fallen to his lot to cut the first sod on the site of the sewerage works in 1904. For twenty-five years he held the appointment of medical officer and public vaccinator No. 1 district of the Newport Union. He also served as physician and surgeon to many of the friendly societies in the town and district, and for upwards of forty years he was senior trustee to the local lodge of Oddfellows. He also served as visiting physician to the Annabelle Lady Boughey Cottage Hospital, Newport, until his retirement, when he was appointed consulting physician to that institution. During the war he acted as medical officer to the British Red Cross hospital which was established at Longford Hall. He joined the British Medical Association in 1874, a year previous to the formation of the Shropshire and Mid-Wales Branch in 1875. A staunch and devout Churchman, he held the office of warden at the Newport parish church from 1886 to 1890, and was vice-chairman of the parochial church council from the time of its inception until last year. He took an acute interest in Adams Grammar School, Newport, of which he was one of the representatives of the urban council on the board of managers. He was also a manager of Newport Church of England schools.

The possessor of a robust constitution, as a young man he made his rounds either on horseback or in a gig, occasionally driving tandem, and it is on record that in one day he covered 100 miles in this fashion. Always willing to help the cause of sport, Dr. Elkington was a keen huntsman in his younger days, and was well known as an excellent judge of horses, but with advancing years he was forced to relinquish this activity, and devoted himself wholly to his professional work, which became his sole hobby. He was twice married. His second wife, who also came of an old medical family, was the elder daughter of William E. Baddeley, F.R.C.S., to whose practice he succeeded, and whose father and grandfather had both previously practised in the same town. By this marriage he leaves five daughters and four sons, two of whom are members of the medical profession—namely, George E. Elkington, *M.C.*, M.B., F.R.C.S., who succeeded him in the practice, and John St. Clair Elkington, M.D., F.R.C.P., who is assistant physician to, and physician in charge of, the neurological department of St. Thomas's Hospital. His youngest daughter married Richard M. J. Harper, M.D., honorary physician to the North Devon Infirmary, Barnstaple.

Dr. F. A. Anderson (Shrewsbury) writes:

The death of Dr. Ernest Elkington of Newport, Shropshire, has removed from among us another of those fine old family physicians so characteristic of the nineteenth century. When last I saw him, a few weeks before he passed away, I was struck by his mental alertness, which age and illness had not dimmed, coupled with a serenity which seemed to me the mark of a life well lived and a duty nobly done. This sincerity, uprightness, and singleness of high purpose gained for him the appreciation of patients of all classes, to whom he was not only a physician, but a counsellor and friend. To his colleagues he was loyal to a degree, a staunch upholder of the finer points of medical etiquette, and a model of old-world courtesy. One of a long line of doctors practising in Newport—actually since 1760—he carried on the best traditions of the past while maintaining an open and lively appreciation of the many advances which occurred in his lifetime.

Dr. H. Willoughby Gardner (Church Stretton) writes:

Many years ago, when the late Dr. Elkington and I were both in active practice, I used to meet him from time to time in consultation, and always esteemed it a privilege to do so. A courteous gentleman and a wise counsellor, he was a notable example of the best type of the old-time " family doctor " ; one who, after a brilliant career as a student, had been content to settle down as a general practitioner in a little country town, and to become a part of the life of our English country.

J. T. KITCHIN, M.D., D.P.H.

Former Medical Superintendent, Bradford Infectious Diseases Hospital

Dr. James Tyson Kitchin, who died at Bradford on November 25th, was a twin son of the late Henry Kitchin, J.P., of St. Bees. He was born at Whitehaven on June 14th, 1866, and was educated at St. Bees School, Edinburgh University, and Guy's Hospital. He graduated M.B., C.M.Ed. in 1887, and M.D. in 1892. In 1900 he took the D.P.H. After graduating he held the posts of resident surgeon at the Edinburgh Royal Infirmary and house-surgeon, Whitehaven and West Cumberland Infirmary. In 1898 he was appointed medical superin-

tendent of the Bradford City Infectious Diseases Hospital, which post he held till 1931, when he retired. During the war, though he had just reached the age limit, he offered his services to the Government, and was granted a commission in the R.A.M.C. (T.F.), being sent to France, where he was put in charge of an infectious diseases hospital near Havre. He served till the Armistice. He was an ex-president of the Bradford Medico-Chirurgical Society, and when the annual meeting of the British Medical Association was held in Bradford in 1924 he was honorary secretary of the Section of Medical Sociology.

Dr. Kitchin was essentially a student to the end of his days. He kept himself well up to date in his special subjects, and he was recognized by his colleagues as an authority on infectious diseases. There were few men who were his equal at performing a tracheotomy, especially in an infant. He was widely read in literature and poetry, and languages were another of his favourite studies. Even after he retired he still read books on anatomy and physiology. Though not an athlete, he was a very useful cricketer in his young days, and to the end he followed the game keenly. As a man Dr. Kitchin was rather shy and retiring, but his kindly disposition and unfailing courtesy made him universally appreciated and respected, both by his colleagues and by his patients. It has been said that he had never been known to say an unkind word. He is survived by a widow and a son and daughter. A memorial service was held in the Bradford Cathedral on Saturday, November 28th, and was attended by many of his professional brethren and friends. He had been a member of the B.M.A. since 1890.

Sir EDWIN DELLER, LL.D., Principal of the University of London since 1929, was severely injured on November 27th when a skip or metal bucket fell on him and his companions during a tour of the new University buildings in Bloomsbury to inspect the work in progress. He was removed to University College Hospital suffering from spinal injuries, and died three days later. His death at the age of 53 removes a man of exceptional gifts as administrator and organizer, whose loss will be deeply felt by the University. A memorial service will be held on Monday, December 7th, at 12.30 p.m., at Christ Church, Woburn Square, W.C. Those attending are asked to give their names at the door. Academic costume (black gowns only) will be optional.

We regret to announce the death of Dr. RICHARD HENRY VEREKER, who had practised for many years at Curry Rivel in Somerset. A student of Carmichael College, Dublin, he qualified L.R.C.S.I. in 1884, and L.R.C.P.I. and L.M. of the Rotunda Hospital in 1885. During a large part of his working life Dr. Vereker was medical officer and public vaccinator for the Curry Rivel district of Langport Union. He was a member of the British Medical Association for fifty years, and in 1925 his colleagues showed their appreciation by electing him president of the West Somerset Branch.

Dr. ALEXANDER MITCHELL, a well-known Aberdeen practitioner, died at his home, 70, High Street, Old Aberdeen, on November 25th. Dr. Mitchell was a native of Inveravon, Speyside, and in his youth served an apprenticeship to a bookbinder in Elgin, afterwards proceeding to Edinburgh, where he graduated M.B., C.M. in 1892. Shortly after graduation he took over the practice of the late Dr. Polson in Old Aberdeen, and in 1902 was joined in partnership by his brother, the late Dr. Peter Mitchell. He retired from practice on the death of his brother in 1929. Dr. Mitchell took a keen interest in local affairs, and for many years was a member of the Aberdeen School Board. He is survived by two sons and his brother, Sir William Mitchell, Vice-Chancellor of Adelaide University.

The death took place, on November 21st at Thornbury, of Dr. JOSEPH VAN SOMEREN TAYLOR, who had been in practice in Bradford for twenty-six years. The eldest son of Dr. Birdwood van Someren Taylor, he was born in 1881 in South China, where his father was for fifty years a medical missionary. From Manchester Grammar School Dr. Taylor went to study medicine in the University of Edinburgh and obtained the Scottish triple qualification in 1904, following this with the Liverpool diploma in tropical medicine. He joined the Colonial Service, and for a time was medical officer at the Colony Hospital, Grenada, in the West Indies. During the war he served with the temporary rank of captain R.A.M.C.

Dr. JAMES WILLIAM GRANGE, whose death was announced in this column last week, came of Scots ancestry. He was born in Liverpool in 1859, the son of a sea captain of the old Allan Line, who commanded a troopship during the Crimean War, and, incidentally, conveyed Florence Nightingale on her historic mission. He graduated at Glasgow in 1881, and soon afterwards was appointed house-surgeon to Sir Hector Cameron. Dr. Grange (writes a colleague) grew up in the early days of Listerian teaching, in which he was a confirmed believer at a time when it was only very half-heartedly accepted by the profession. During his long life he saw great advances in the technique of surgery and obstetrics. He personally saw an amazing example of the application of Listerian principles whilst at Cumnock in the middle 'eighties. A farmer who had been gored by a bull walked from a mile distant to the surgery supporting his intestines in his hat. Dr. Grange and his partner disinfected the parts, sutured the abdominal wall, and the patient made a complete recovery. A man of the highest character and gentle and unassuming manner, he devoted himself untiringly to his patients of all classes, by whom he was universally beloved, as he was esteemed by his colleagues. He was a past-president of the Pathological Society of Manchester. After fifty-five years in general practice he retired at the end of October, 1936. Essentially an outdoor man, his chief interests lay in geology, ornithology, and botany, and at one time he held a commission in the 3rd Lanarkshire Rifle Volunteers, and was a noted rifle shot. In sport he was a keen fisherman, and the last day of his life was spent in the active pursuit of his favourite sport on the river in Dovedale.

We announce with regret the death, at the age of 54, of Dr. DAVID ANDERSON of South Woodford, Essex. Dr. Anderson was a native of Aberdeen, and graduated M.A., M.B., Ch.B. at Aberdeen University in 1907. He practised successfully for some thirteen years at Shipley, Yorkshire, before settling at Woodford in 1924. During the war he served in the R.A.M.C. with the 49th Division in France. Dr. Anderson was a member of the Essex Panel Committee, and in Woodford he had endeared himself to all with whom he came into contact by a modest and charming disposition. He is survived by his wife and one daughter, who has only recently begun her medical studies at Aberdeen University.

Dr. JOHN MAY HERBERT MUNRO, who died at Bath last month, was born in 1855, and graduated D.Sc. of the University of London in 1877. He took an active part in founding the Downton Agricultural College in Wiltshire, and lectured on agricultural chemistry there in the 'eighties. At Downton he collaborated with Dr. John Wrightson in pioneer experiments on the use of basic slag as a phosphatic manure. In later years he made an experimental study of malting barley. At the age of 30 Dr. Munro entered as a medical student at University College, Bristol, and after winning a scholarship at the Bristol Royal Infirmary, obtained the M.R.C.S. and L.R.C.P. diplomas in 1900. Thenceforward he devoted himself to bacteriology and biochemical problems. He was for some time honorary pathologist to the Royal Mineral Water Hospital, and bacteriologist to the Bath Eye Infirmary.

Medico-Legal

DAMAGES AGAINST A DOCTOR'S WIDOW

Connolly v. Rubra

Mr. Justice Greaves-Lord gave judgement on November 24th awarding £5,000 damages and costs to Mrs. Margaret Connolly, widow of Matthew Connolly. Mr. Connolly was a civil servant who at the date of his death was receiving a salary of £1,044 a year. It was stated that if he had lived to be 60 he would have received up to £1,450 a year and then a pension of £536 and a gratuity of £1,465. He was the sole support of his wife and two young sons. In December, 1930, he suffered from an attack of coughing and called in a Dr. Henry Rubra. He told the doctor that his coughing was severe and accompanied by spasmodic attacks; that he had a raised temperature at night and spat blood, which formed streaks in the sputum; that he had lost weight; that in July, 1929, he had had an attack of haemoptysis while bathing. He suffered from considerable bronchitis and, when the doctor was called in, was spitting so much blood that he kept a bowl by his bed. The doctor said that he could not say that the blood came from the patient's chest, but that there was enough trouble in his throat to account for it. He treated Mr. Connolly for bronchitis, but did not advise any special diet or treatment and did not have the sputum examined; he ultimately allowed the patient to return to work. In February, 1931, the doctor stated that the cough, which persisted, would probably remain as chronic bronchitis or catarrh. Mr. Connolly and his wife therefore did nothing more about the cough during 1931, but he became gradually worse, losing strength and weight, and in February, 1932, he was seriously ill. During the illness of 1932 the doctor looked at the patient's throat from time to time, but could only account for the condition by suggesting tonsillitis and adenoids. A sputum test made at this time was negative. The doctor's attention was called to the history of gradual decline and to the patient's night sweats, which he diagnosed as rheumatism. When the patient tried to get up he collapsed, and he and his wife suggested taking a second opinion, but the doctor dissuaded them, saying that he himself was "good on the chest" and that the collapse was of the kind that might follow influenza. He examined the chest and recommended a tonic, but did not suggest an *x*-ray examination. He put off a second suggestion of consulting a specialist. The cough continued to be troublesome and the throat grew worse, until at the beginning of 1933 the patient found he could hardly swallow. During that year the doctor brought no apparatus to examine the throat and prescribed no special treatment except various gargles, the last of which was carbolic and caused the patient very serious discomfort. In March Mr. Connolly was examined by a throat specialist, and a radiograph was taken and a sputum test made. The lung condition was serious; the throat condition involved the epiglottis. Although he then came under expert care he died. His widow sued the doctor for negligence and the case came before the court in June, 1936. Dr. Rubra, however, fell ill and died in July, and Mrs. Connolly continued the action against his estate, suing his widow as executrix of his will.

The Judgement

The case was heard towards the beginning of November, and when on November 24th the learned judge delivered his reserved judgement he pointed out that a plaintiff suing a medical man for negligence must show a want of competent and ordinary care and skill. Unfortunately, he remarked, in the absence of Dr. Rubra there had been no real evidence of what the doctor had done. Dr. Hebert, an expert witness, had given evidence with conspicuous fairness on the possibility of an alternative diagnosis, which might have been the view of Dr. Rubra and might have been a justification for his failure to diagnose tuberculosis, but as Dr. Rubra could not give evidence this alternative remained a mere suggestion. The three expert witnesses who had been called agreed that when there was blood in the sputum tuberculosis could not be eliminated without further investigation. He therefore considered that the omission of the doctor to have the sputum microscopically examined at the beginning of 1931 was not a mere failure to take care, but a failure to take elementary care such as no medical man ought to have omitted to take. In his view, if that step had been taken, tuberculosis would have been found then, for the radiograph was consistent with much earlier tuberculosis and there had been a gradual decline throughout 1931. If tuberculosis had been found then he saw no reason why the disease should not have been arrested and Mr. Connolly's life substantially prolonged. There could have been no conceivable excuse for not pursuing researches in 1932; at the latest, tuberculosis would have been found early in 1932, before it had become incurable. Having regard to the opinion of the patient which Dr. Rubra had expressed, the learned judge had, he said, thought fit to make allowances and to take into account many factors which might give Mr. Connolly a shorter expectation of life and prevent him from responding completely to treatment. He came to the conclusion that a fair sum to award as damages was £5,000: £3,500 to go to the widow, £700 to the elder son, and £800 to the younger son.

Law Reform Act, 1934

Before the passing of the Law Reform Act, 1934, a personal action ended with the death of either party, and if this case had happened then Mrs. Connolly could not have sued the doctor's widow. That Act, however, gave her the right to obtain such damages as the patient could have been awarded if he had not died.[1] The damages allowed under the Act must not include loss to the estate due to the death. The important question is whether the absence of the deceased, whose conduct has been the ground of the action, is likely to prejudice the defence. It is difficult not to suppose that Dr. Rubra could not have given much fuller reasons for his conduct if he had been a witness. On the other hand, the action was commenced against him personally and his legal advisors doubtless heard all he had to say in his defence. The case was not therefore quite on all fours with an action started against the estate of a doctor who has been dead for a considerable time and who had no knowledge that the action was contemplated. After the Act was passed, doctors and their legal advisers asked themselves whether it brought an added risk to a doctor's survivors, and that question now becomes more acute. Nevertheless, this hardly seems a case in which the risk was substantially increased by the doctor's death before the hearing, and it is a little early to conclude finally that the Act puts a doctor's family in greater danger of financial loss than if the damages were given against him personally.

The Services

The King has conferred the Efficiency Decoration of the Territorial Army upon Lieut.-Colonels William Hogarth Kerr and John Miller Chrystie, R.A.M.C. (T.A.), and Majors William Robert Watt and Harry Mainwaring Holt, R.A.M.C. (T.A.).

DEATHS IN THE SERVICES

Colonel John Colpoys Connor, C.M.G., late R.A.M.C., died at Hythe on November 16th. He was born at Derinagree in Ireland on August 13th, 1867, was educated at Queen's College, Belfast, and graduated M.B., B.Ch., and B.A.O. in the Royal University of Ireland in 1889. Entering the Army as surgeon on January 31st, 1891, he became lieutenant-colonel on January 4th, 1913, brevet colonel on June 3rd, 1919, colonel in 1921, and retired on August 30th, 1924. He served throughout the South African War, 1899 to 1902, taking part in operations in Cape Colony and Orange River Colony, and receiving the Queen's medal and the King's medal with two clasps each; and in the war of 1914-18, when he was mentioned in dispatches in the *London Gazette* of December 6th, 1916, and July 21st, 1917, and received the C.M.G. in 1917. He had been a member of the British Medical Association for over thirty years.

[1] See *British Medical Journal*, September 29th, 1934, p. 600, "Death and the Survival of Rights of Action."

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

The House of Commons considered this week the Trunk Roads Bill and the measure dealing with the carriage of munitions to Spain by British vessels. The House of Lords rejected the Voluntary Euthanasia (Legalization) Bill. Some account of the debate will appear next week.

The Nutrition Committee of the Conservative Party was addressed at the House of Commons on December 1st by Sir John Orr.

The Geneva Convention Bill introduced in the House of Lords on November 25th by Lord Templemore proposes to give effect to Article 28 of the Geneva Convention of July 27th, 1929, for the amelioration of the condition of the wounded and sick of armies in the field. This prohibits the use, without the authority of the Board of Trade, for purposes of trade or business, of the cross comprised in the arms of the Swiss Confederation, or of any design being a colourable imitation of the red cross on a white ground mentioned in the Geneva Convention Act, 1911, or of any words nearly resembling the words "Red Cross" or "Geneva Cross."

A petition from London and other places for the prohibition of the vivisection of animals was presented to the House of Commons on November 30th.

Mr. A. C. Bossom has been appointed a member of the Select Committee on Medicine Stamp Duties in place of Admiral T. Beamish.

Unsatisfactory Housing Conditions in Glasgow

On November 24th Mr. ELLIOT informed Mr. Buchanan that at the end of October, 1936, 34,375 one-apartment houses in Glasgow were occupied. The number of houses in Glasgow without a separate water-closet was about 100,000; few, if any, of these houses had a bath. The number of houses with a separate water-closet but no bath was about 53,000.

Mr. BUCHANAN also asked if Mr. Elliot was aware that in the Gorbals Division of Glasgow large numbers of families were living in one-apartment houses with no lavatory accommodation; that in some cases the house was occupied by five or six children and two adults and in other cases occupied by members of a family who suffered from tuberculosis, and that these people had made repeated efforts for houses without success.

Mr. ELLIOT said he was aware that conditions in the Gorbals Division were substantially as stated in the question, although in letting houses to overcrowded families the corporation was guided by its medical officer of health, who gave full weight to the existence of an infectious case of tuberculosis in a family applying for a house. It would take time to eliminate all the unsatisfactory houses in Glasgow, but he was in constant touch with the corporation to ensure that the maximum possible progress was maintained.

Nutrition and the Public Health

Sir Francis Fremantle presided over a meeting of Members of Parliament at the House of Commons on November 25th when Major-General Sir ROBERT MCCARRISON gave an address on "Nutrition and the Public Health," claiming that malnutrition, with consequent poor physique and ill-health, must be recognized as an enemy at the gates. Sir Robert suggested six requirements for its defeat: (1) education of children, parents, teachers, and doctors; (2) the provision of "protective" meals for necessitous children; not merely milk, but milk, cheese, and eggs, whole-meal bread, butter, and fruit or green vegetables—a fit meal for every child, rich or poor; (3) the provision of similar "protective" meals for pregnant and nursing women; (4) the fullest utilization of the land for the production of "protective" foods; (5) the employment of much larger numbers of the unemployed on the land, and in such production; and (6) the cheapening and quick transport of "protective" foods. In the course of his address Sir Robert criticized the excessive use of meat, sugar, and white bread. In the matter of nutriment, he said, meat had no superiority over milk, and sugar was lacking in vitamins. He pleaded for extended provision of allotments, which are already beneficially affecting the health of thousands. He also stressed the value of herrings, and such neglected foods as skimmed milk and buttermilk.

Report of Departmental Committee on Coroners

Sir JOHN SIMON said on November 26th, in reply to Mr. Sorensen, that there was unlikely to be an opportunity in the present session of dealing with the recommendations of the Departmental Committee on Coroners. Legislation would be required to give effect to the principal recommendations.

Milk-pasteurizing Plants

Sir KINGSLEY WOOD, replying on November 26th to General Clifton Brown, said he knew of the report from the Institute of Dairying which related to the period ending September, 1935, and found that a high proportion of pasteurizing plants, in London and elsewhere, were producing improperly pasteurized milk. General CLIFTON BROWN asked if the Minister would take more drastic measures against inefficient pasteurizing plants, in view of the fact that 37 per cent. of the samples tested gave a positive result and 90 samples from milk supplied to school children were contaminated. Captain HEILGERS asked whether partly pasteurized milk was not more dangerous to public health than ordinary clean milk. Sir KINGSLEY WOOD said he could not reply on the general matter. The difficulty to which General Clifton Brown drew attention had chiefly arisen through pasteurizing plants not being in proper working order. Answering Major Colfox, Sir Kingsley Wood said he must contradict the assertion that the recent epidemic at Bournemouth had nothing to do with the milk supply.

Juvenile Health in Durham

Mr. ERNEST BROWN, in a reply to Mr. W. J. Stewart on November 26th, said the junior transfer centre in Durham was opened in July, 1935, and, during the year from July, 1935, to June, 1936, 571 boys were submitted for medical examination, of whom 109, or 19.1 per cent., were rejected on medical grounds. Boys rejected for reception into the centre were those considered by the medical officers to be permanently unfit for employment away from home or to be in need of medical treatment. The centre was conducted by the education authority, which had recently been asked to consider accepting at the centre boys in need of simpler kinds of medical treatment. The authority already had power to provide medical inspection and treatment for boys attending junior instruction centres. As regards instructional centres, the proportion of men in the county of Durham who were rejected on medical grounds during the period January to October, 1936, was about 17 per cent. Figures for earlier years were not available. Young men who were rejected owing to dental trouble could receive remedial treatment at the instructional centre at Hamsterley. Arrangements were being made for the opening of two local training centres in the county of Durham at which young men suffering from minor physical disabilities would be able to receive treatment. Mr. Brown did not agree that the rejections were partly due to under-feeding.

Inquiry into Working-Class Family Expenditure

On November 30th Mr. SANDYS asked the Minister of Health when the present investigation into the distribution of working-class family expenditure would be completed; and whether the scope of this inquiry was such as would provide all the necessary data to enable the Government to formulate a comprehensive nutrition policy. Mr. R. S. HUDSON regretted he could not yet say when the necessary inquiries would be completed. They were being pursued with all expedition. Mr. Sandys repeated his question whether the inquiry would provide necessary data to enable the Government to formulate a comprehensive nutrition policy. Mr. HUDSON said the House could rely on the Government getting all the necessary facts together before it formulated any policy. Mr. SANDYS then gave notice that he would raise the question again at the earliest opportunity.

Recommendations of Milk Reorganization Commission

On November 30th Mr. SANDYS asked if, in view of the declared policy of the Government to encourage the consumption of liquid milk, it was intended to adopt measures to give effect to the relevant recommendations of the Milk Reorganization Commission. Mr. W. S. MORRISON replied that the recommendations of the Commission, which covered a wide field, would receive the careful attention of the Minister concerned. He was not in a position at present to make any further statement.

Mr. ELLIOT, replying on December 1st to Lieut.-Colonel Moore, said his attention had been called to a statement indicating that the various educational authorities in Scotland interpreted in different ways the regulations with regard to the milk-in-schools scheme, and that in consequence in some areas children were receiving far more free milk than in others. The application of the statutory provisions governing the supply of food (including milk) for school children was a matter under the local authorities. The whole question of milk supply was being considered in connexion with the recently published report of the Reorganization Commission.

Vaccination and Small-pox Deaths

On December 1st Mr. GROVES asked the Minister of Health how many deaths occurred among the 11,930 unvaccinated and 1,756 vaccinated cases of variola minor respectively treated in the small-pox hospitals of the London County Council during the years 1928 to 1934; what were the ages in the fatal cases in question; and what were the ages in the fatal cases which were vaccinated or revaccinated after exposure to small-pox? Sir KINGSLEY WOOD replied that twenty-three deaths occurred among the unvaccinated cases. The ages of the patients were as follows:

Age	Number of Cases	Age	Number of Cases
2 days	1	10 years	1
3 ,,	1	11 ,,	1
12 ,,	1	13 ,,	1
17 ,,	1	17 ,,	1
3 weeks	2	45 ,,	1
4 ,,	1	56 ,,	1
5 ,,	1	58 ,,	1
7 months	2	59 ,,	1
2 years	2	69 ,,	1
5 ,,	1		23
7 ,,	1		

Of these twenty-three fatal cases eleven patients were vaccinated for the first time after exposure to infection. Their ages were as follows:

Age	Number of Cases	Age	Number of Cases
3 days	1	5 years	1
12 ,,	1	13 ,,	1
3 weeks	1	58 ,,	1
4 ,,	1	59 ,,	1
7 months	2		11
2 years	1		

Eleven deaths occurred among the vaccinated cases. The ages were as follows:

Age	Number of Cases	Age	Number of Cases
37 years	1	63 years	1
45 ,,	1	66 ,,	1
46 ,,	2	67 ,,	1
50 ,,	1	79 ,,	1
55 ,,	1		11
56 ,,	1		

Of these eleven fatal cases, all of which were vaccinated in infancy, three patients had been vaccinated for the second time after exposure to infection. Their ages were as follows:

Age	Number of Cases
50 years	1
63 ,,	1
79 ,,	1

Inquiry into Malnutrition in Colonial Dependencies

On November 30th Mr. MANDER asked the Foreign Secretary whether, in accordance with the resolution of the last Assembly of the League of Nations, the Government was still giving full support to the Health Organization of the League of Nations in its inquiries into the widespread malnutrition which existed in the Tropics and certain Far Eastern countries. Viscount CRANBORNE replied that the Government welcomed the resolution, and would give full support to the inquiries proposed. Last April a circular dispatch had been sent to all Colonial Dependencies asking for a full survey of the question and directing attention to its importance. The Prime Minister had recently appointed a committee of the Economic Advisory Council to advise and make recommendations on nutritional matters in the Colonial Empire. This committee would keep in touch with the work of the League of Nations. The subject would form part of the agenda of the conference on Rural Hygiene in the Far East, which was to meet in Java next summer under the auspices of the Health Organization. Steps were being taken to ensure strong delegations from all British Colonial Dependencies concerned.

Localized Tuberculosis in Animals for Human Consumption

Mr. HUDSON told Mr. Oliver on November 30th that the Minister of Health had considered a resolution from Heanor Urban District Council advocating extension of the law to prohibit the sale for human food of any carcases of animals found to be affected with localized tuberculosis from which the affected parts had been removed and destroyed. Few representations had come from other local authorities on this subject. A memorandum issued by the Minister of Health defined in detail the limits within which the meat of animals found to be affected with localized tuberculosis might be passed for human consumption. These criteria were adopted upon the recommendation of an expert committee. As at present advised Sir Kingsley Wood did not see any sufficient reason to depart from them.

The Bournemouth Typhoid Outbreak.—On December 1st Mr. GROVES asked the Minister of Health whether the medical representative of the Ministry who had been inquiring into the Bournemouth typhoid fever outbreak had furnished him with definite proof that a certain milk supply was the cause of the outbreak; and, if so, would he state the nature of that proof? Sir KINGSLEY WOOD replied that the report submitted to him on this outbreak showed that in all the primary cases of enteric fever which occurred during the outbreak the patients had consumed milk from the same source of supply, and that after this supply was pasteurized no further primary cases occurred. [Further reference to this matter appears at page 1166.]

Smoke Abatement.—Sir KINGSLEY WOOD, answering Mr. Shinwell on November 26th, said no reliable estimate could be given of the annual cost imposed upon the public through the emission of smoke from domestic and industrial chimneys. Many steps were being taken to abate the smoke nuisance with his encouragement by local authorities, industrial interests, and voluntary organization, who were co-operating in the matter. Smokeless methods of using coal were being increasingly developed both for domestic and for industrial purposes. To prohibit the use of raw coal in certain selected areas as an experiment would require legislation.

Cheap Milk Scheme in Rhondda.—On December 1st Mr. JOHNSTON asked the Minister of Agriculture if he could give any information as to the extent and results of the scheme for the provision of cheap milk to children of pre-school years and to sick and nursing mothers in the Rhondda. Mr. RAMSBOTHAM replied that the scheme referred to was operated by the Milk Marketing Board, with assistance from the funds at the disposal of the Commissioner for the Special Areas and in co-operation with the local authority and local distributors. As to the extent and results of the scheme, he referred Mr. Johnston to a reply given on November 12th. Subsequent figures showed that up to November 28th applications to participate in the scheme had been received in respect of 4,091 persons, including 334 nursing mothers, 386 expectant mothers, and 3,371 children under 5. Approximately 96,000 pints of milk were supplied under the scheme in November. He understood that the Milk Marketing Board, in conjunction with the Commissioner for the Special Areas, is carefully exploring the possibility of starting similar schemes in other areas. He could not state the results on the physique of the persons who had participated in the scheme, but the Milk Board was arranging a special investigation.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a congregation held on November 28th the following medical degrees were conferred:

M.D.—E. G. Recordon, G. J. Meikle, E. M. Dimock, H. L. H. H. Green.

M.B.—A. D. Hodges.

B.CHIR.—E. B. Z. Masterman, E. M. Dimock, H. L. H. H. Green.

UNIVERSITY OF WALES

WELSH NATIONAL SCHOOL OF MEDICINE

The following candidates for the degrees of M.B., B.Ch. have satisfied the examiners in the subjects indicated:

SURGERY.—Rona Price-Davies, H. E. Seingry, J. Thomas.

PHARMACOLOGY.—O. D. Beresford, J. M. Bowen, Mary W. Bowen, J. Harris, G. E. Hosking, H. V. Jones, D. R. B. Mathias, Margaret Parry, J. L. Rees, W. L. Ll. Rees.

OBSTETRICS AND GYNAECOLOGY.—Gweneth Howell, Lynda B. Powell, J. A. B. Thomas.

PATHOLOGY AND BACTERIOLOGY.—W. G. Miles.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—M. Barker, R. F. B. Bennett, J. A. G. Gulliford, L. W. La Chard, H. L. W. Sixsmith.

MEDICINE.—F. Hamed, C. R. Hardman, C. J. S. Sergel, H. L. W. Sixsmith, F. J. C. Smith.

FORENSIC MEDICINE.—F. Hamed, C. R. Hardman, C. J. S. Sergel, H. L. W. Sixsmith, F. J. C. Smith.

MIDWIFERY.—C. C. B. Guest, T. A. M. Johns, J. H. Lewis, F. L. Skinner.

The diploma of the Society has been granted to C. R. Hardman, T. A. M. Johns, J. H. Lewis, C. J. S. Sergel, and H. L. W. Sixsmith.

Medical News

Sir James Crichton-Browne, M.D., F.R.S., who still enjoys good health, celebrated his ninety-sixth birthday on November 29th.

Dr. George Henry Fox, the Nestor of American dermatology and formerly professor at the New York Post-Graduate College, celebrated his 90th birthday on October 8th. In 1902 he described the condition since known as the Fox-Fordyce disease.

The Duke of Kent, President of University College Hospital, will open the new building extensions of the hospital on Wednesday, December 16th.

The Duke of York will preside at the Industrial Welfare Society's dinner at the Hotel Victoria, Northumberland Avenue, W.C., on Wednesday, December 9th. Other speakers will include Lord Baden-Powell, Mr. A. V. Alexander, M.P., Commander Sir Charles Craven, Mr. Frank Hodges, Mr. H. S. Souttar, and the Rev. Robert R. Hyde.

The Bristol Medical School annual reunion dinner will be held at the Victoria Rooms, Clifton, Bristol, on Thursday, December 17th, at 7.30 p.m., when Mr. C. A. Moore will be in the chair, and the guest of the evening will be Dr. Henry Devine, F.R.C.P., medical superintendent of Holloway Sanatorium. Tickets (price 10s. 6d.) and further particulars from the honorary secretary, Mr. V. T. Baxter, Bristol Royal Infirmary.

A complimentary luncheon to Miss Olga Nethersole, C.B.E., will be given by medical and other friends at Claridge's Hotel, Brook Street, W., on Thursday, December 10th, at 1 for 1.15 p.m., when Viscount Leverhulme will preside. Applications for tickets (price 10s. 6d. each) should be made to the secretary of the luncheon, 12, Stratford Place, W.1.

The seventy-fourth annual meeting of the Royal Surgical Aid Society will be held at the Mansion House, E.C., on Tuesday, December 8th, at 4 p.m.

At a public meeting arranged by the National Birth Control Association for Monday, December 7th, at the Friends House, Euston Road, N.W., at 5 p.m., Professor H. J. Laski will speak on "National Welfare and the Problem of Population." Lord Horder will take the chair as president of the association, and invitation cards may be had from the secretary, 26, Eccleston Street, S.W.1.

Sir Henry Gauvain will deliver the Purvis Oration before the West Kent Medico-Chirurgical Society at Miller General Hospital, Greenwich, S.E., on Friday, December 11th, at 8.45 p.m. His subject is "Conservative Treatment of Surgical Tuberculosis."

A post-graduate course, conducted in German, French, and English, will be held in Budapest from January 11th to 16th, 1937. The course is free and no registration fee will be required. Lodging and service may be obtained for 16 pengö the week in the Doctors' Home attached to the National Institute for Hygiene, or lodging, service, and board for 30 pengö, and the Hungarian State Railways offer a 30 per cent. reduction in fares. Those wishing to participate in the course should write to the secretary, Professor B. Johan (VIII, Üllöi ut 26, Budapest, Hungary).

The issues of the *Journal de Médecine de Lyon* for November 20th and the *Paris Médical* for November 21st are devoted to forensic medicine.

The King has granted Major William Irving FitzGerald Powell, R.A.M.C., authority to wear the decoration of Commander of the Order of the Nile, conferred by the King of Egypt in recognition of valuable services rendered by him.

On November 27th Sir William Collins, M.D., performed the ceremony of opening the new nurses' home and the *x*-ray and massage departments which have been provided by the London County Council at St. James Hospital, Balham.

The King has granted Dr. Thomas Hawks McLeod authority to wear the Insignia of the Fourth Class (Civil Division) of the Order of Al Rafidain, conferred upon him by the King of Iraq in recognition of valuable services rendered in the capacity of chief medical officer (Mosul Liwa) in the Iraq Civil Health Service.

Colonel H. H. Johnston, C.B., C.B.E., M.D., has been appointed a deputy lieutenant for the County of Orkney; and Major B. H. H. Neven-Spence, M.D., F.R.C.P.Ed., M.P. for Orkney and Shetland, a deputy lieutenant for the County of Zetland.

Dr. Harvey Cushing of Boston was recently elected an honorary member of the National Academy of Medicine at Buenos Aires.

A centenary loan exhibition is being planned for 1937 to celebrate the centenary of the accession of Queen Victoria. The proceeds will be given to King's College Hospital, which was founded two years after Queen Victoria came to the throne.

The University of Calcutta has undertaken an investigation into the nature of epidemic dropsy. Dr. Surendranath Roy has been entrusted with the research under the direction of Sir Nilraban Sircar.

The German Ministry of the Interior issued instructions on September 25th with regard to the examination of the blood for alcohol in connexion with traffic accidents.

The General Assembly of French Medicine will be held at the Hôtel-Dieu, Paris, under the presidency of Professor Fernand Besançon, on January 10th, 1937, when the following subjects will be discussed: primary tuberculous infection, typhoid fever, the birth rate, and physical education.

Professor August Bier, the well-known surgeon of Berlin, was 75 on November 24th.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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QUERIES AND ANSWERS

Case for Diagnosis and Treatment

"A. O. F." writes: Dr. H. L. Selwyn's patient (*Journal*, November 28th, p. 1123) appears to me to be a fit subject for hypnotic treatment. I find it invaluable in these cases. There is evidently a strong subconscious "shame complex" from his infantile life to be dealt with in this case. A long and tedious psycho-analysis would probably bring this to light, but a quicker, and in my opinion a more effective, method would be in the hypnotic state induced at weekly intervals and deepened at each sitting. Hetero-suggestion and auto-suggestion can then be given. I have no doubt the patient will be cured by this treatment.

Income Tax

Alteration of Premises

"M." owns two contiguous houses, A and B, A being used as a surgery. Some alterations were made which took two rooms from B and added them to A. They were formerly rated at £20 each, and have now been rated at £30+£13=£43. Has "M." any remedy?

⁂ The alterations made justify reconsideration of the values *de novo*, and the question resolves itself into—What rent would a hypothetical tenant pay for the properties as now altered? We think that "M." would have great difficulty in proving the new values to be excessive in the circumstances.

LETTERS, NOTES, ETC.

Corpse Blood for Transfusion

Dr. M. R. SONI (Withington, Manchester) sends the following note on the use of cadaver blood in the Soviet Union, supplementing the account given in the *Journal* of May 2nd, 1936 (p. 894): On August 31st a party of British and American doctors visited Professor Yudin's clinic at Sklifasorocogo Hospital for Acute Emergencies in Moscow, and had the interesting experience of seeing a woman surgeon remove all the blood from the body of a patient that had been brought dead to the hospital in an ambulance—death having occurred in the street from angina pectoris. This blood, it was explained, would later, within the next twenty-four days, be used for transfusion purposes. As the hospital received only acute emergency cases—both medical and surgical—from all over Moscow, it naturally received a number of bodies of those who had died suddenly in the home or the street or in the ambulance while being conveyed to hospital. All such bodies, without the permission of the relatives or the coroner, were drained of the blood by a surgeon. The operation was performed with due care and asepsis, within six hours of death, the blood being drained from the internal jugular vein and received in wide-mouthed sterile bottles. A body normally yielded about 2,000 to 2,500 c.cm. of blood. No citrates or chemicals were added to the blood, which was kept at a slightly low temperature in a refrigerator. When required the bottle was placed in warm water for a short period before use, it was gently shaken, and its contents injected into the vein by the drip method. Professor Yudin told us that he had given cadaver blood to over 1,500 patients without mishap. In a case of carcinoma of the stomach occurring in a young woman with 20 per cent. haemoglobin he gave 4 litres of blood slowly in two days, and after a week, when the haemoglobin had risen to 70 per cent., he performed gastrectomy successfully—the patient being still alive two years after the operation. It must be added that after the blood is drawn the body is in every case subjected to post-mortem examination, and the blood is discarded if death has occurred from tuberculosis, cancer, any acute infectious disease, etc. Further, the blood is carefully examined both bacteriologically and serologically and typed. The blood that has passed through these tests is considered as good as fresh blood from a donor, if not better. Certainly it is easier to administer. The surgeon told us that cadaver blood "lived" for twenty-eight days after the death of the person, but to be on the safe side it was discarded after being stored for twenty-four days. We were informed that cadaver blood is being used all over the Soviet Union without any untoward results. The patients are not informed of its nature.

Founder of the Humane Society

Last Saturday was the 200th anniversary of the birth of William Hawes, M.D., founder of the Royal Humane Society. He was born at Islington, London, on November 28th, 1736, and died on December 5th, 1808. In 1773 he and his exact contemporary, Dr. Thomas Cogan, who was also interested in resuscitation of the apparently drowned, called a meeting in London to establish a humane society. The object of this society was at first confined to the recovery of persons suffering from suspended animation from any cause, but especially from drowning. To-day the society, with headquarters in London, has 300 depots supplied with life-saving apparatus distributed throughout the kingdom. The Hawes family have been closely connected with the society since its first days, and two of the founder's descendants are members of the present committee. His life-work is epitomized in the inscription on a tablet to his memory placed in St. Mary's Church, Islington, by the Royal Humane Society. A biographical note appeared in the *Manchester Guardian* of November 27th, 1936, and there was a letter commemorating Hawes, with portrait, in the *Times* of the following day.

Herpes and Varicella

Dr. T. J. T. WILMOT (Louth, Lincs) writes: Correspondents who have given notes about the association of these two conditions may be interested to hear that I am at present attending a man of 90 years with an extensive costal shingles, five inches across, who also developed typical chicken-pox all over. The chicken-pox is now disappearing, and the patient is improving steadily.

Disclaimer

Drs. STANLEY J. HARTFALL and HUGH G. GARLAND (Leeds) write to disclaim all knowledge of an article on rheumatoid arthritis which appeared in the *News Chronicle* on December 1st.

A Warning

Dr. H. F. WATTSFORD (honorary secretary, Newcastle Division) writes: It has been brought to my notice that an ex-medical student has been calling on various doctors in this district borrowing, on various pretexts, sums of money, which he has failed to repay.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 65, 66, 67, 68, 69, 70, 71, and 74 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 72 and 73.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 312.